

BBC MICRO • MASTER • ELECTRON • ARCHIMEDES

£1.30

ACORN USER

OCTOBER 1987

BEST-SELLING AND BIGGEST BBC/ACORN MAGAZINE

WIN AN ARC:



In our competition

ALL SORTS:
Putting your
data in order

IN CONTROL:
First steps into
the real world

ADVENTURES:
Lighting the dark
ages at school

DESIGN COUNSEL:
How to write
better programs

WEATHER

Forecasts from short-wave
radio in the classroom



CRAZEE RIDER

FREE:
ENHANCED BBC
MASTER VERSION
• Extra Race Circuits
• Haunting Music
• Extra-Demo Mode
• Auto-Game Features
• Extra Game Features



A PROGRAMMING BREAKTHROUGH
The first Electron motor racing game to faithfully represent the bends and chicanes of major international racetracks.



Setting the Scene



Going round the bend at Misano (BBC MICRO VERSION)



Knocking off an opposing rider (BBC MICRO VERSION)



Clever Electron programming techniques (ACORN ELECTRON VERSION)

If you can't beat them, knock them off!

Howling round the bends at Le Mans at 150 m.p.h. is a daunting experience. You'll need nerves of steel and slick reflexes to finish in the Top 6 and qualify for the next race. If, at first, you can't make the grade you can always let off steam (and gain bonus points) by bumping into the other riders and knocking them off their bikes; listen for the terrified wail as the rider is sent flying to the ground.

Each race has 60 participants — and the further you get, the tougher the competition becomes. Bonus points are awarded for a good finishing position, and your "hit-count" shown at the top of the screen records the number of other riders you have sent tumbling from their steeds.

Seven top international racetracks are featured:-

- Le Mans (France)
- Anderstorp (Sweden)
- Paul Ricard (France)
- Brands Hatch (U.K.)
- Misano (Italy)
- Silverstone (U.K.)
- Nurburgring (W. Germany)



An enhanced version has been specially produced for owners of the BBC Master Series computers. Included free with all BBC Micro cassettes and discs, this version features several extra race circuits, a beautiful 6-minute musical soundtrack, and a host of extra game features — making full use of the Master's extra memory and capabilities.

BBC Micro Cassette £9.95 Acorn Electron Cassette ... £9.95
BBC Micro 5½" Disc £11.95 Acorn Electron 3½" Disc. £14.95
BBC Master Compact 3½" Disc £14.95

(Compatible with the BBC B, B+ and Master Series computers).

PRIZE COMPETITION

A superb MZ Simson sports moped (illustrated above) worth £500 is the first prize in our competition.

To enter the competition, you must finish in qualifying position on the first 21 racetracks, and note down the congratulatory messages you receive. Closing Date: 31st March, 1988.

Please make all cheques payable to "Superior Software Ltd".



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS



OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately. (This does not affect your statutory rights).

**SUPERIOR
SOFTWARE**
Limited

ACORN SOFTWARE

Dept. CR1, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453

MICRO MEDIA

Computer Supplies Ltd.

Freepost,
Dept. AU, Rydal Mount, Baker Street
Potters Bar, Herts EN6 3BR (NO STAMP
REQUIRED)

0707 52698 (5 lines)

See you at
PCW SHOW
Stands 3044 and 4211
23rd-27th September

5 1/4 MICRO MEDIA Brand Discs

	10	30	50	100	250
SS/DD	6.55	18.55	29.05	53.10	118.00
DS/40T	7.90	22.30	34.90	64.60	144.50
DS/80T	9.40	26.50	40.20	75.15	165.90
DS/HD for PCAT	20.10	57.20	90.10	168.60	385.55

5 1/4 Reversible discs (Flippy's)

Have two write protect notches & index holes.

Suitable for 40 or 80 track drives.

10.55 30.00 47.40 88.10 204.55

3 1/2 MICRO MEDIA Brand

	10	30	50	100	250
SS/DD	17.55	50.45	80.25	147.70	347.80
DS/DD	18.75	53.90	85.95	159.20	376.55

5 1/4"

All discs supplied are with labels, 5 1/4" write protects, envelopes & hub rings.

Discs purchased direct from one major manufacturer. 100% certified error free - lifetime guarantee.

**PRICES
INCLUDE
V.A.T.**

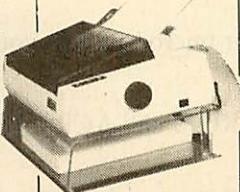
3 1/2"

Printer Stand

5mm perspex

80 Column Version
400 x 310 x 100mm
22.80

132 Column Version
600 x 310 x 100mm
28.60



Mobile Printer Stand

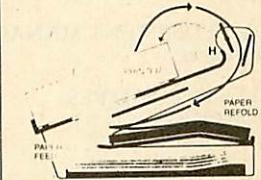
Rugged steel frame. Height adjustable basket for output paper & base shelf for input paper. Self assembly - includes castors

80 column £52.50
132 column £67.90

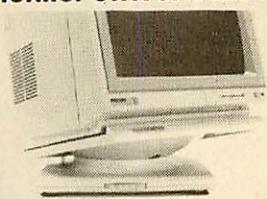
The Space Saver

Paper feed and refold positioned one above the other. Dial controlled paper feed with adjustable deflectors ensures smooth flow and automatic refolding.

80 column 132 column
414x380x460mm 530x380x460mm
1 34.40 1 43.00
3+ 32.10ea 3+ 40.70ea
6+ 30.50ea 6+ 38.65ea



Monitor Swivel Bases



Pan tilt revolves around 360 degrees
12.5 degrees tilttable up and down
Adjustable by front mechanism.
55x280x260mm 55x355x320mm
for 12" Monitors for 14" Monitors
1 13.25 1 16.70
3+ 12.60ea 3+ 15.90ea
6+ 11.95ea 6+ 15.05ea

Adjustable Copy Holder

A4
adjustable desk clamping.
Magnifying cursor line.
Paper thickness adjustment.
Paper height adjustable clip.
A4 Version 24.00
Holds up to 300g
Desk Top Version 13.69
Holds up to 1000g
A3 Version 42.45
Holds up to 1400g

Printer Ribbons

Prices (£) per each ribbon

3 6 12

Amstrad 8512/8256 5.65 5.35 4.90

R.G, BR, BL, Y 7.50 7.10 6.55

DMP 2000/3000 2.80 2.60 2.35

Brother HR15 MS 3.30 3.10 2.80

R.BR, BL 4.35 4.10 3.75

Centronics GLP 3.65 3.45 3.15

R.G, BR, BL, Y 4.65 4.40 4.00

Canon 1080/1156 3.30 3.10 2.80

R.G, BR, BL, Y 4.95 4.65 4.25

Citizen 120 D 4.70 4.35 4.15

Diablo Hytype II MS 2.80 2.65 2.40

R.BR, BL 3.80 3.55 3.25

Epson FX/MX/RX 80 FX 800 3.55 3.35 3.10

R.BR, BL, G, Y 4.95 4.65 4.25

MX 100/FX 1000/FX 105 4.65 4.35 4.20

R.BR, BL 5.85 5.55 5.10

LX 80/86 GX 80 2.80 2.65 2.40

R.G, BR, BL, Y 4.70 4.45 4.05

Juki 6100 MS 3.30 3.10 2.80

6100 SS 2.05 1.90 1.75

R.BR, BL 2.75 2.60 2.35

Kaga KP810/910 3.30 3.10 2.80

R.G, BR, BL, Y 4.95 4.65 4.25

M/Tally MT80 MS 4.10 3.85 3.55

Panasonic KXP110 5.50 5.20 4.75

R.G, BR, BL, Y 7.20 6.80 6.25

Qume IV MS 3.30 3.10 2.80

Fabric 3.30 3.10 2.80

Star NL 10 5.50 5.20 4.75

Shinwa CP80 MS 4.10 3.85 3.55

One off if ordered with other product

Please mix colours and types for best prices

R = Red, BR = Brown, BL = Blue, G = Green,

Y = Yellow

If the ribbon you require is not listed please

let us quote

The above is a small selection of the 250

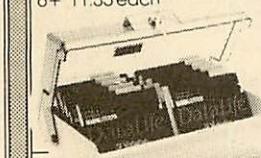
different ribbons we stock. We shall be

pleased to find your ribbon, however old

or obscure.

MD 120

1 12.55 5 1/4" x 120
3+ 11.90 each
6+ 11.35 each



MD 50

5 1/4" x 50
1 7.80
3+ 7.40 each
6+ 7.10 each

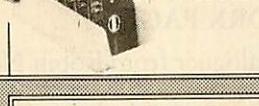


Wire Printer Stand

stacks print-out in document tray automatically. Suitable for most standard printers. Made of safety coated steel wire.
For 80 column £14.80

MD 100

5 1/4" x 100
1 10.80
3+ 10.30 each
6+ 9.80 each



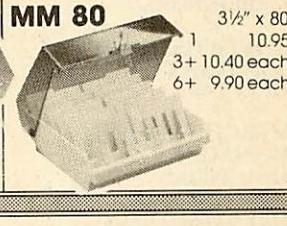
MM 40

3 1/2" x 40
1 8.30
3+ 7.90 each
6+ 7.50 each



MM 80

3 1/2" x 80
1 10.95
3+ 10.40 each
6+ 9.90 each



ALL PRICES INCLUSIVE OF POSTAGE & PACKING AND V.A.T.

MICRO MEDIA
Computer Supplies

Freepost, Dept. AU, Rydal Mount, Baker Street, Potters Bar, Herts EN6 3BR



Access & Visa



Out of Office Hours (Answer machine)

0707 52698 (5 lines)

Orders despatched 24 hrs.

Please allow 5 days for delivery.
For next day delivery, please ring for details. Postage covers U.K. only.

A Catalogue is available with a more comprehensive range of products including - 3M & Verbatim discs - a wider choice of paper labels, ribbons and accessories.

Ring or write to obtain your copy now!

Educational and HMG orders accepted. For official orders/invoice/credit orders there is a minimum order value of £15.00 excluding V.A.T. Any order under £15.00 will be subject to £3.00 handling charge.

Personal callers welcome
Weekdays 8.30am - 5.30pm
Saturdays 9.30am - 1.00pm

-MICRO MEDIA-MICRO MEDIA-MICRO MEDIA-MICRO MEDIA-MICRO MEDIA-MICRO MEDIA-1

ACORN USER

ISSUE No 63 OCTOBER 1987

EDITOR
Tony Quinn

DEPUTY EDITOR
Steve Mansfield

TECHNICAL EDITOR
Graham Bell

SUB-EDITORS
Stuart Anderton
Chris Jones

EDITORIAL SECRETARY
Pauline McLernon

TECHNICAL ASSISTANT
Robert Miller

ART DIRECTOR
Mike Lackersteen

ART EDITOR
Liz Thompson

ASSISTANT ART EDITOR
Paul Holmes

EDITORIAL MANAGER
Ellen Brush

PRODUCTION ASSISTANT
Teri North

GROUP ADVERTISEMENT
DIRECTOR
Stefanie Blower

ADVERTISEMENT MANAGER
Gary Lucas

SALES EXECUTIVES
Thomas Rashid
Shane Hussien

ADVERTISEMENT
PRODUCTION
Jonathan Marsh

ADVERTISEMENT
ASSISTANT
Nicky Lewis

MERCHANDISING
MANAGER
Sarah Bullard

MERCHANDISING
ASSISTANT
Seran Anderson Haddick

PUBLISHING DIRECTOR
Michael Potter

EDITORIAL DIRECTOR
Christopher Ward

NEW USERS

HINTS & TIPS:

Martin Phillips discusses *View* printer drivers and how to revamp your micro

43

FIRST BYTE:

Tessie Revivis examines the new Basic launched with the Archimedes

49

REVIEWS

GAMES:

The Games Page with show news plus a cricketing competition

157

GAMES:

Arkanoid, Paperboy and Konami Coin-op Hits reviewed

159

SOFTWARE:

Fancy a flutter? Your micro can help you pick the hot tips

161

SOFTWARE:

The Beebug Master ROM and ACP's Advanced Quarter-Meg RAM examined

163

HARDWARE:

David Johnson-Davies likes the sound of Hybrid's music system

165

SOFTWARE:

Steve Mansfield takes a first look at *View Professional*

171

EDUCATION

NEWS:

The latest in educational computing

141

THE SWORD IN THE SOFTWARE:

Chris Drage and Nick Evans relate their experiences of using educational programs

146

THE NETWORK PAGE:

A network cataloguer from Robin Newman

153

REGULARS

News	7	Yellow pages	113	Graphics, RAM offers	134
Letters	35	Order forms	129	ROMs offers	135
Acorn Forum	53	Calligraphy, Education	131	User Groups	173
Subscription offer	94	Viewchart, Games offers	132	Free Ads	175
Competition	110	Listings, Binders	133	Acorn Abuser's Diary	176

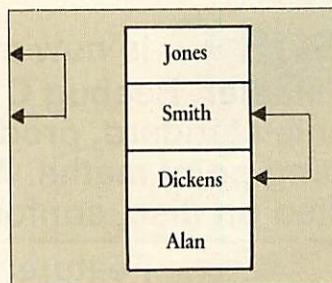
Published by Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF. Tel: 01-836 2441. Subscriptions: Contact Gail Fairhall, Redwood Publishing Ltd, Lambourn Woodlands, Newbury, Berks. Tel: (0672) 40888. UK £17.50; Europe £25; Middle East £30; Americas, Africa £35; rest of the world £40; (price inc p&p for 12 issues). Printed by Riverside Press, Gillingham, Kent. Typeset by Tabloid Fotoset, London. Colour reproduction by Clerkenwell Colour, London. Print production by Aquarius Print and Design, London. Distributed by Comag, Tavistock Road, West Drayton.



FEATURES

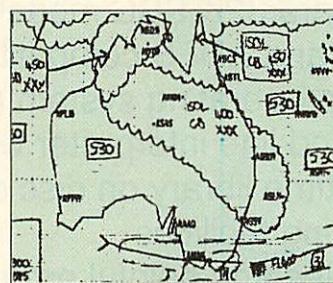
SORT IT OUT YOURSELF/Page 81

Joe Telford explains several methods of sorting lists and creates a simple database



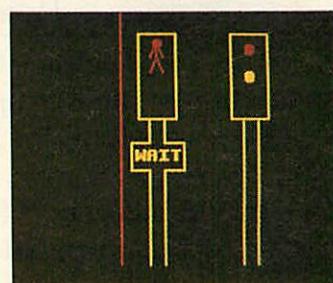
FORECASTS BY FAX/Page 88

The airwaves are full of weather maps! Terry Morris describes how to download them into your micro



GAIN CONTROL/Page 95

Robotics and computer control can seem a daunting subject. Peter Julian introduces the principles



BETTER BY DESIGN/Page 108

A structured approach to programming makes for easy to understand listings. Peter Eggleton explains the secrets



BACK TO SCHOOL/Page 141

This month's *Acorn User* is an education special edition. School computer users start here



COVER



Illustration by Michael Bennett

NEXT MONTH

Your business is our business; Joe Telford builds a toolkit of programs, Rob Macmillan examines uses for *View Professional*, Bruce Smith reviews *InterBase* and we explain macros

BEEBUG



A full implementation producing the most compact code in the fastest compilation time, for the BBC Micro and Master series.

The Language C is now available from Beebug for all users of the BBC Micro and Master. Beebug C conforms to, and extends beyond the Kernighan and Ritchie standard, producing fast, compact code and supporting full floating point maths. A comprehensive set of library functions are supplied on disc, conforming to the proposed ISO standard.

Features Include

- ◆ Runs on a standard 32K BBC model B, B+ or Master 128
- ◆ 40/80Track DFS and ADFS compatible
- ◆ Support for Acorn operating system (Vdu, Osbyte, Mode etc.)
- ◆ Powerful command line interpreter with over 20 commands & qualifiers
- ◆ Expandable run-time library on disc containing approximately 100 functions
- ◆ Full macro-handling facilities
- ◆ Debugging facilities and helpful error messages

Technical Summary

Beebug C is a full implementation of the Kernighan & Ritchie standard.

Expressions: *, &, -, !, ~, ++, --, sizeof, ->, *, /, %, +, -, >>, <<, <, >, <=, >=, &, ^, |, &&, ||, ?:

Assignments: =, +=, -=, *=, /=, %=, >>=, <<=, &=, ^=, |=

Declarations: char (8 bits), int (16 bits), short (8 bits), long (32 bits), float (32 bits), double (32 bits), unsigned, void, auto, static, extern, typedef, struct, union (inc. bit fields)

Statements: if, while, do, for, switch, case, default, break, continue, return, goto

Preprocessors: #define, #undef, #redef, #include, #if, #ifdef, #ifndef, #else, #endif, #line etc.

Library: over 90 library functions, plus 12 header files inc. h.stdio, h.stdlib, h ctype

Please supply ____ Beebug C package(s) at £59 each. Postage £1.

I enclose a cheque for £_____ Official orders welcome.

Please debit my Access/Visa/Connect card with £_____

Access/Visa/Connect No

--	--	--	--	--	--	--	--

NAME: _____

EXPIRY DATE: ____ / ____

ADDRESS: _____

24 hour order hotline (0727) 40303

Beebug , Dolphin Place, Holywell Hill, St. Albans, Herts AL1 1EX

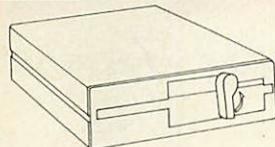
BEEBUG C is supplied on two 16K ROMs & a dual format disc

**Price
£59.00**

To write C programs you will need a text editor or word-processor such as View, Wordwise, InterWord etc.

The Perfect Partners.

VIGLEN DISK DRIVES



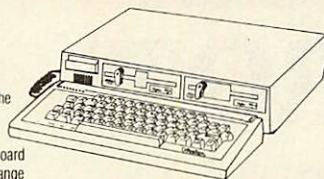
Simply plug a Viglen disk drive into your BBC B (fitted with DFS), B+, or Master micro and immediately benefit from 400 or 800 KB of extra data storage capacity.

Stock Code	Description	Price inc. VAT	
VPD 0241	400K Single Drive, No PSU	£119.95	
VPD 0246	400K Single Drive, + PSU	£134.95	
VPD 0243	800K Dual Drive, No PSU	£222.95	
VPD 0249	800K Dual Drive, + PSU	£249.95	3-YEAR WARRANTY
VPD 0249	800K Bridge Unit + PSU	£264.95	
VPD 0250	5.25" + 3.5" Combined + PSU	£249.95	
SPO 14	Single 400K 40/80T Drive	£ 99.95*	
SPO 19	Dual 800K 40/80T Drive	£189.95*	SPECIAL OFFER

* These two models are offered with 12 months warranty.

Please add £8.00 for insured courier delivery.

PROFESSIONAL CONSOLE UNIT

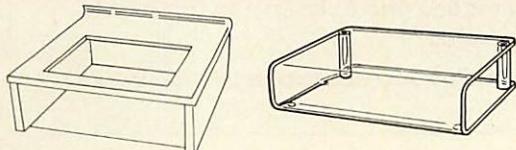


Give your BBC or Master micro a professional PC-look by replacing the existing lid with this smartly styled package which can house two disk drives. Complete with separate keyboard case and connecting cables. A full range of accessories is also available.

Stock Code	Description	Price inc. VAT
VO851	Viglen Professional Console Unit for the BBC micro	£49.95
VO861	Viglen Master Console Unit for the Master micro	£59.95

Please add £8.00 for insured courier delivery.

PRINTER STANDS



Viglen's printer stands are available in	Price inc. VAT
clear perspex, 80 col.	£19.95
136 col.	£29.95
high-impact ABS plastic colour-matched to most printers.	
80 col.	£14.95
black metal finish	£ 9.95

Viglen's printer stands cater for 80 and 136 column printers and allow continuous stationery to be stored underneath.

Please add £3.00 postage and packaging.

HOW TO ORDER

Simply fill in the coupon or write to us with your requirements enclosing a cheque/ postal order or your credit card no. for the total amount. Don't forget to add the cost of delivery. Allow 7 to 10 days for delivery. Credit card holders may order by telephone on our sales hotline 01-843 9903 (8 lines). Orders from overseas should be exclusive of VAT (Please deduct 15% from the total cost).

Prices correct at time of going to press and offers are subject to availability. Dealer, Trade & Education Enquiries Welcome.

Fill in and post to Viglen Ltd., Unit 7, Trumpers Way, London W7 2QA. Tel. No. 01-843 9903. Please make cheques and postal orders payable to Viglen Ltd.

STOCK CODE	DESCRIPTION	QUANTITY	TOTAL PRICE
------------	-------------	----------	-------------

Please find enclosed a cheque/postal order I prefer to pay by VISA ACCESS Tick one please.

Card No. _____ Signature _____ Expiry date _____ Total _____

Name _____ Address _____

Postcode _____ Tel. no. _____

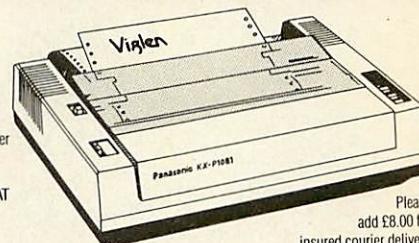
PANASONIC PRINTER KIT

The Panasonic KX-P1081 comes complete with £45.00 worth of accessories FREE including tractor feed and roll feed units with paper, printer cable, and a specially designed metal printer stand.

Features include:

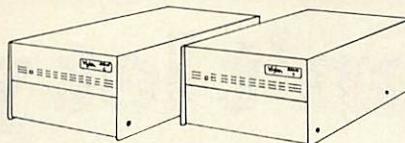
- 120 cps draft printing, 24 cps NLQ
- IBM and Epson compatibility through dip switch settings
- Prints 80 columns on A4 cut sheets, continuous stationery or roll paper
- 9x9 draft and 18x23 NLQ

Stock Code	Description	Price inc. VAT
SPO 79	Panasonic KX-P1081 plus accessories	£189.95



Please add £8.00 for insured courier delivery.

VIGLEN WINCHESTER DISKS

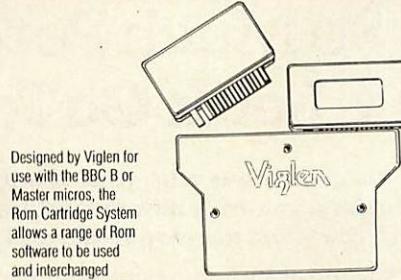


Plug-in 20 to 112MB of extra storage with the Viglen Winchester system.

Please add £8.00 for insured courier delivery.

Stock Code	Description	Price inc. VAT
Drive 0 Single	VB20 20MB Viglen Winchester	£ 649.00
VO150	VB28 28MB Viglen Winchester	£ 699.00
VO155	VB40 40MB Viglen Winchester	£1045.00
VO156	VB56 56MB Viglen Winchester	£1119.00
Drive 1 Second Drive		
VO160	VB120 20MB Drive 1 Winchester	£ 549.00
VO162	VB128 28MB Drive 1 Winchester	£ 599.00
VO165	VB140 40MB Drive 1 Winchester	£ 819.00
VO167	VB156 56MB Drive 1 Winchester	£ 899.00
VO157	20MB Tape Streamer Backup	£ 724.95

ROM CARTRIDGE SYSTEM



Designed by Viglen for use with the BBC B or Master micros, the Rom Cartridge System allows a range of Rom software to be used and interchanged easily without fear of damage to the delicate pins. The system is simple to fit and requires no soldering.

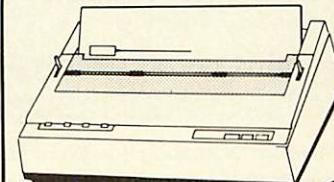
Stock Code	Description	Price inc. VAT
VO560	Viglen Rom Cartridge System for BBC	£12.95
VO559	Viglen Rom Cartridge System for BBC (low profile)	£12.95
VO550	Viglen Rom Cartridge System for Master	£14.95
VO561	Single Viglen Cartridge	£ 3.99

Please add £2.50 for postage and packing (£0.50 for single cartridge).

The Panasonic KX-P3131 daisywheel printer is Diablo-compatible and utilises bi-directional logic seeking techniques to produce letter quality print at a rate of 17 characters per second (cps). Friction speed provides really efficient paper handling, whilst tractors are available as an option.

Stock Code	Description	Price inc. VAT
VO400	Panasonic KX-P3131 Daisywheel Printer	£299.95

Please add £8.00 for courier delivery.



Send NOW for our special offers booklet

Viglen

Viglen Ltd., Unit 7, Trumpers Way, Hanwell, London, W7 2OA
Telephone: 01-843 9903
Telex: 919 304 VIGLEN G
Fax: 01-574 5126

SALES HOTLINE 01 843 9903





Don't let your Computer ROT!

Your BBC Micro/Master Has So Much Potential –
Don't Let It Go To Waste

At Beebug we are keen to help you get serious with your computer. Our magazine (currently sent out to 20,000 members) aims to stimulate you with new and interesting ideas and to keep you up to date with the latest developments and programs.

Whether you are a hardened computer buff or a complete beginner, Beebug has much to offer you.

As A Member Of Beebug You Would Benefit From:

- Free access to our technical support team, to obtain impartial advice and help on any computer hardware, or software problems.
- A swift mail-order service for all your hardware & software needs at competitive prices, with 5% members discount.
- A showroom with knowledgeable staff on hand, where you can try out the latest hardware, peripherals and software.
- Free personal adverts in the magazine to sell your unwanted kit.
- A Trade-In service to upgrade your BBC to a Master.

A New Members Pack, including screen planning sheets, key strip, computer reference card, a 56 page introduction to your computer, membership card, mag. indexes & latest magazine.

Recent issues of Beebug have included informative features and programs on the following subjects:

Business Graphics, Sideways Ram Construction Project, Home Banking, Sorting Data Files, Character Definitions, Storage Oscilloscope, Master Printer Buffer, File Security, Letter Headings, Virtual Arrays, View Printer Driver, Auto-Alarm, Chart Recorder, Help System.

As well as these we regularly include articles for beginners and experts, workshops, reviews, news, hints & tips and much, much more.

FOR A FREE BEEBUG INFORMATION PACK PHONE St. Albans (0727) 40303

I would like to subscribe to Beebug for 1 year and receive a new members pack and the next 10 issues of the magazine.
My machine is a BBC/Master/Compact. Delete as appropriate.

Name _____

Address _____

Signature _____

I enclose a cheque for £_____ /Please debit my Access/Visa account with £_____ Card expiry _____

Card No.



Subscriptions may now also be placed on Micronet 800. Just type *BEEBUG #

All payments must be in pounds sterling.
Cheques must be drawn on a UK bank.

Subscription Rates

UK, BFPO, Ch Is	£12.90
Rest Of Europe	£19.00
Middle East	£23.50
America & Africa	£26.00
Elsewhere	£28.00

**Send To Beebug, Dept. AU10, Dolphin Place,
Holywell Hill, St. Albans, Herts. AL1 1EX.**

Or Phone St. Albans (0727) 40303

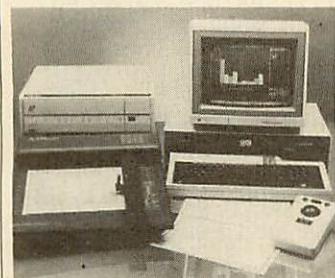
BEEBUG

Stop The Rot And Join Now

NEWS

Hard copy from Domesday

The wealth of information in the Domesday system is no longer trapped in the machine. It's now possible to get printouts of the thousands of tables and charts.



Plotmate: AIV printouts

Linear Graphics has produced software which processes data on the National disc into pie, bar and line charts, and is free with the Plotmate range.

News in brief

■ Following the success of its Punjabi wordprocessor, RS Computer Systems has released a Hindi version. The company has already had a good response to the product from dealers in India, but it also hopes to sell the package to schools here. Details are available from RS Computer Systems on (0203) 23055.

ਦੁਨਿਆ ਕੇ ਸਮੀਂ ਧਰਮ-ਗੁਣਥਾਂ ਦੇ ਮਾਵਨਾ ਪ੍ਰਗਟ ਕੀ ਹੈ। ਜਿਨ ਅੰਕ ਰਾਂਕਾਂ ਦੇ ਵੇਖੇ ਹੀ ਪ੍ਰੋਗਰਾਮਾਂ ਦਿਤੇ ਸਕੇਂਦ ਮਿਲਿਆ ਹੈ ਕਿ ਤਨਕੇ ਪ੍ਰਕਾਰਨੇ ਦੇ ਸਾਥ ਹੀ ਮਨੁਧਾਂ।

Hindi wordprocessing

■ *Screenprint* is a program which dumps the current screen to a printer. Its supplier, ESM, claims that it will work with almost any software, and requires just two key presses. The price is £25. Contact ESM on (0945) 63441.

Multi-tasking for Archimedes

The Archimedes is set to take on Commodore's Amiga 2000 with a new multi-tasking operating system, enabling the computer to run several programs at the same time.

Acorn's David Bell confirmed that it is working on a Unix-like operating system for the Acorn RISC Machine (ARM) chip, but stayed tight-lipped about the details.

There has been speculation that the system is called ARX; the name appears on some internal Acorn documentation.

But multi-tasking is greedy on memory, so the new system will be for the 400 series only.

Another future ARM-based machine will be aimed at the engineering and graphics work station market. This will use faster, but much more expensive, memory chips. This in turn means the ARM processor can run faster. And redesigned video and memory controller chips will allow more memory and even better graphics.

Acorn has cleared up some confusion about the high resolution graphics in the 400 series machines.

The 300 and 400 series work identically in all modes up to mode 20, but extra circuitry in the 400 series allows it to go beyond a resolution of 640 by 512. Two extra screen modes are available offering graphics resolutions of up to 1280 by 976 in monochrome, and 160 columns by 122 lines of text, but only using a special monitor.

This makes the machine ideal



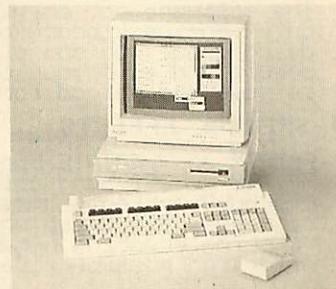
Amiga: multi-tasking plus DOS

for computer-aided design, and Acorn aims to implement the industry standard package, *AutoCAD*, on the Arc.

Microvitec monitors can be made to work with the Arc's RGB output, but the picture quality is poor. The company is producing an Arc-compatible monitor soon.

■ Acorn has announced two separate systems for running IBM PC compatible software on the Archimedes.

The first is an emulation of the IBM PC's 8088 chip. It's similar to the 6502 emulator,



Arc: faster competitor

being software based, and will run legal MS-DOS programs.

The other package is a podule with its own 80186 processor - like the Master's 512 co-processor but with an IBM-standard disc controller chip. Some PC software titles directly access this chip so it should be 'more compatible'. It also allows you to add a 5.25-inch disc drive, to read PC discs. Acorn claims the podule is 'faster than a PC-AT'.

■ The Arc is a finalist in this year's British Microcomputing Awards.

Micro market buoyant

The home computer market is still alive and well, says a report by Key Note Publications.

Although the boom period has long gone, spending on home micros is on the increase again and should reach £390 million by the end of the year. At the same time unit sales are down, reflecting a shift from cheap, games-oriented machines towards more expensive, business-type micros.

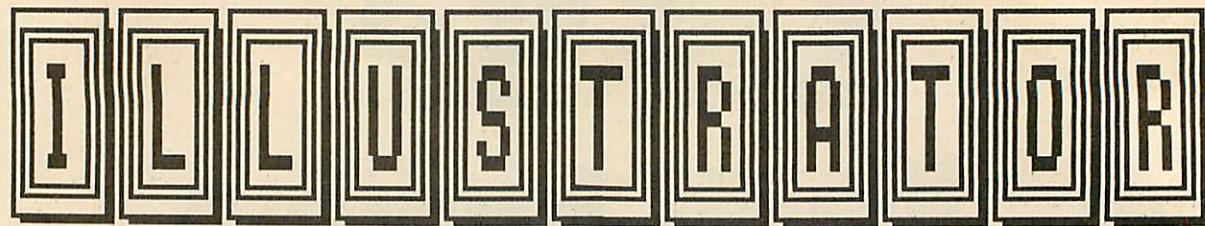
Key Note defines home micros as machines costing under

£500, which now includes cheap IBM PC clones. The report shows how, as a result, the market has shifted towards more serious uses - like word-processing and accounts.

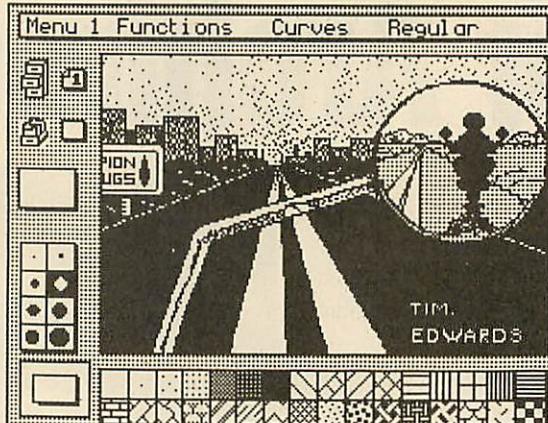
The report also notes Amstrad's apparent takeover of the home micro market. Taking into account both Amstrad and Sinclair machines, the company now sells nearly two-thirds of all computers under £500.

The Home Computers/Software Report costs £89.

Introducing the NIDD VALLEY



GRAPHIC SOFTWARE for CREATIVE DESIGNERS.



■ DESIGN YOUR OWN ICONS PATTERNS AND BRUSHES

The software not only has an extensive library of designs, but you can also create and edit your own to save and reload later.

■ SPECIAL EFFECTS

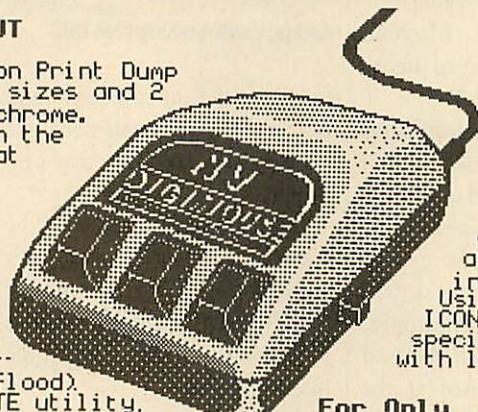
FLIP X or Y, ROTATE through 90, 180 or 270°, and using the HOLD option, shapes can be repeatedly drawn whilst rotating, creating hundreds of design possibilities.

■ HIGH QUALITY PRINTOUT

The high resolution Epson Print Dump gives you a choice of 4 sizes and 2 densities in crisp monochrome. WYSIWYG! What you see on the screen is what you get at the printer - no loss of detail and no distortion. This very powerful print option is designed to allow illustrations to be incorporated with Word Processor text.

■ AND THERE'S MORE!

SPRAY and FILL (line & flood), Easy to use CUT and PASTE utility, plus GRAB and CUT from saved screens redrawn at a size of your choosing. A GRIDLOCK option allows you to place designs on an invisible grid. And its DISC BASED!!!! NO ROM's to fit.



For Only
£49.90
inc. VAT & Postage

■ PULL DOWN WINDOWS

Drawing functions and utilities are selected from 8 pull down and 4 popup windows. These are obtained from two main menu and two file ICONS.

■ DRAWING OPTIONS

Every possible drawing option has been provided including LINE, MULTILINE, RAY, CIRCLE, ELIPSE, SECTOR, CURVE, and POLYGONS. These can all be rubber banded or enlarged/reduced.

Shapes may also be drawn inverse or filled with or without outline. TEXT can be entered in a choice of 2 styles and 3 sizes, plus you can design your own FONTS with the powerful ICON designer utility.

■ ZOOM and PIXEL EDITOR

Using the superb full screen zoom and scroll feature allows you to make fine detail corrections and designs one pixel at a time. The current pixel area is shown in an actual size off screen window. Using this feature in conjunction with the ICON and GRIDLOCK enables icons, fonts and special shape designs to be generated quickly with little or no graphics experience.

ILLUSTRATOR
IS PACKAGED WITH THE NIDD VALLEY
DIGIMOUSE

FOR THE BBC MICRO

A GREAT MATCH!

The Graphics and Text used in the above advert were produced using ILLUSTRATOR, DIGIMOUSE and an Epson GX-80 printer.

THE NIDD VALLEY MOUSE

This high quality, British mouse features a unique LINEAR LOCK which allows you to draw perfectly straight lines freehand, independently of the software.

The non-slip ball is held firmly in place and keeps in constant contact with your work surface. The mouse uses optical electronics, precision engineered to exacting standards.

Designed for comfort and long periods of effortless use, with an exceptionally smooth and accurate control.

ARTROOM/ACE SOFTWARE

Well-reviewed graphics design package from Clares, supplied on disc, with DIGIMOUSE, for the MASTER or COMPACT. Includes an extensive library of symbols, borders and pictures, zoom for detailed editing, reserve screen, selection of proportional fonts, and the full range of drawing options.

High resolution graphics and excellent print out quality. Supplied complete with 'ACE' Artroom Colour Extension.

ILLUSTRATOR & DIGIMOUSE
BBC 40 track DFS

£49.90 incl. VAT

ILLUSTRATOR software only
BBC 40 track DFS

£19.90 incl. VAT

ARTROOM/ACE & DIGIMOUSE

Master 128, 80 track ADFS

£64.90 incl. VAT

Compact 3½" disc

£68.90 incl. VAT

DIGIMOUSE only

BBC or Compact

£34.90 incl. VAT

WHEN ORDERING PLEASE STATE WHICH MODEL COMPUTER

NIDD VALLEY MICRO PRODUCTS LTD

Dept AU1087

FREEPOST, Wetherby, West Yorkshire LS23 7YP, England.

Telephone: 0937 844661 Telex: 57453 MYSEC G

Upwardly mobile downloading

Trendy micro owners who've moved up from Filofaxes to Psion Organisers can now use their BBC micros to interrogate their electronic diaries.

The PERX package from XOB is a hardware and software link which allows you to program and read Organiser II datapacks using the BBC micro as a terminal.

The hardware link accepts one or two Psion EPROM packs. Software for the Organiser which has been developed on the BBC micro can be downloaded to the pack. Alternatively you can read your notes, addresses, etc from the datapack on to disc. The data can then be loaded into a word-processor or database.

Some schools have started using the Psion Organiser as a field notebook. XOB claims an ability to write specific pro-



Download from Psion to micro

rams for a field project could make the Organiser even more suitable for this kind of work.

The system may also interest small companies who want to produce multiple copies of a Psion program. The complete package costs £69.

Interactive video comes up roses

Interest in interactive video (IV) will grow even more now gardeners have their own software. Intersearch Systems has produced *Gardeners' Questions Answered*, an IV disc which works with the Domesday video disc player.

The disc contains around 2000 photographs of plant varieties, pests and diseases. It's aimed at schools as well as garden centres as a point-of-sale promotion. The user can select between commentaries in English and French.

The disc will cost around £400. Although it works with the Domesday system, Intersearch will supply it as a package with other hardware.

■ Intersearch has also developed a database, called *DISSL*, intended for use with the interactive video system, but also useable with text-only databases. *DISSL* allows you to set-up complex links between text, still and moving pictures which can then be interrogated by other users.

More on The Menu

Two utilities to make life easier with filing systems, ROMs and RAM have been launched by Camelot Computer Services. *The Menu* provides control of ROMs and disc files while *The List* allows you to add descriptive text to filenames. Prices to be announced.

THE COMMS COLUMN

David Atherton has taken over the new expanded Comms Column from Buzz, who will still be writing for us from time to time. If you have an interesting Comms story, send it to David here at AU, or direct to his mailboxes on Prestel (942876210) or Telecom Gold (72:MAG11596).

■ Telecom Gold's new tariff became effective on August 1, and includes a new data transfer charge of 4p (1p at evening cheap rate) per 512 characters, in addition to the per-minute charges which have been reduced from 11p (3.5p) to 6.5p (2p). PSS charges are not part of Gold and so are unaffected. The first 512 characters for each log-on are free. A 1200 baud user can receive over 7000 characters a minute, so the net cost could be as much as 62.5p per minute, an increase of over 400 per cent

The last article I submitted over Gold cost me 10.5p (three minutes). The 10,000-character file would now cost 25p, a hefty increase. Not surprisingly there has been a lot of adverse comment from journalist users. It'll be interesting to see what the general reaction is when the first bills using the data charge are issued.

Interlink, the Micronet gateway into Gold, delayed its introduction of the new charges for a month, and is not levying the new Gold £5 a month charge. Microlink, the largest user group on Gold, has delayed the increases for at least another month after that. Microlink is 'horrified' at the new tariff, but it looks like it too will have to implement it.

■ A new feature in the Comms Column is our spotlight on bulletin boards carrying material of interest to Acorn owners. MusicTel was started by the then 13-year-old James Eckhardt, covering all aspects

of music, from amateur composing to straightforward pop and rock talk.

Now a nationwide network of nine boards, it is just about to install inter-board networking, among other new features. With MusicLink on Prestel currently dormant, this is one of the few places you can find Music 500 coverage. James, now 16, runs the headquarters board on 01-455 0843 (Scrolling, 8N1, V21/V23).

■ Until now there has been no way of directly transferring eight-bit files via any of the main email services. But Telecom Gold has now announced its new FT (File Transfer) service, which implements the popular Xmodem file transfer system, and also the newer Ymodem specification. Initially only available to corporate Gold subscribers, BT says that after an evaluation period the service will probably be offered to all users, including those who use Gold through Microlink and Interlink. For those who need file transfer now, Microlink offers the Kermit file transfer system.

■ An Open University student has solved the problem of not being able to talk to his colleagues by starting an email club. Jim Hatton, an OU science student based in Kilmarnock, was unhappy about not being able to talk about the course and his work with the other students, who are scattered around the country.

His solution was to start the Open University Club on BT's Microlink.

The club is aimed at both students and lecturers. The main advantage, Hatton says, is that he no longer has to bother his busy lecturers with telephone calls. They can now pick up his messages and reply to them in their own time, but without postal delays.

DATATHORN SYSTEMS Ltd

PRESENT THE INCREDIBLE

EPSON GQ-3500 LASER PRINTER

GEORGE HOUSE, 50 SPRING GROVE, LOUGHTON ESSEX IG10 4QD

An advertisement cannot begin to do justice to this superb machine. Send an A4/foolscap s.a.e. for our **FREE FACT PACK** and sample.

with our introductory offer
(strictly limited)

ACORN USERS
**SAVE
£200**

YOU GET:

GQ-3500 printer + parallel cable
+ form design program[†]
+ LaserJet identity card.

PACKAGE VALUE: £1948.80

OUR PRICE: £1748.80

(Free delivery)

- ★ the ultimate for desk top publishing
- ★ compatible with Epson dot matrix text drivers
- ★ prints mixed text and graphics — print form & contents in one pass
- ★ fast — up to six A4 pages per minute
- ★ quiet — no impact noise
- ★ 640KB RAM — programmable — 192KB ROM
- ★ 22 character fonts available
- ★ identity cards available for: LaserJet (see below) and Diablo 630
- ★ new powerful Epson Vector Graphics codes are a superset of the Esc-P codes for dot matrix — destined to become the new industry standard
- ★ ideal for business, school or home use — start your own print business

[†]suitable for BBC B/B+/Master/Compact/Archimedes/Nimbus
please add V.A.T. to all prices

CARE ELECTRONICS

Open
Mon-Thurs 9am — 5pm
Fri — Sat 9am — 4pm

800 ST ALBANS ROAD,
GARSTON, WATFORD.
HERTS. WD2 6NL Tel: 0923-672102

ARCHIMEDES COMBINED 5.2/3.5" DISC DRIVE UNIT

Suitable for Archimedes, Master and the new IBM PC2
Price Each = Ex VAT. Inc VAT.

CARE MASTER ROM CARTRIDGES:

Designed by CARE Electronics to Acorn Specifications. Capable of taking upto

2 x 16K Eproms. Including Inter-word & Spell-Master. CARE Cartridges offer 2 or 4 x 16K options for maximum user flexibility. Opt 1: Standard Cartridge: Opt 2: Single Zif. Opt 3: Dual Zif. Opt 4: Quad Sockets

CARE MASTER SMART CARTRIDGE:

Freeze Prog at any point and dump Screen to Disc/Printer, Copies 99% of Protected programs. Tape-Disc, Disc-Tape, ASCII Dump and much, much more.

	Price Each = Ex VAT.	Inc VAT.
CARE Master ROM Extender	£ 9.00	10.35c
CARE BBC Model B Cartridges	£ 3.00	3.45c
CARE BBC Model B ZIF Cartridge	£ 7.00	8.05c
CARE LOW Profile System (The Original)	£ 11.00	12.65d
CARE Library Rack (Holds 6 Cartridges)	£ 1.60	1.84c
CARE Master Quad Cartridge	£ 13.00	14.95c
CARE Master ROM Cartridge	£ 8.00	9.20c
CARE Master single Zif Cartridge	£ 12.80	14.72c
CARE Master dual Zif Cartridge	£ 17.00	19.55c
CARE Master Smart Cartridge	£ 34.60	39.79c

POWER SUPPLIES:

For use with Disc Drives (Not old full height type)

Dual BBC Outlets	£ 30.00	34.50b
For use with most peripherals	£ 33.00	37.95b

CARE PRINTER BUFFER:

(For Master & Compact/Model B & B+)
Uses SRAM, Spare I/O, User Definable.

Rom Version	£ 14.00	16.10d
5.25" Disc Version	£ 13.00	14.95d

GOVERNMENT & EDUCATION ORDERS WELCOME. HOW TO ORDER:

All prices inclusive of VAT. By post. Enclose your cheque/P.O. made payable to CARE Electronics. Or use your ACCESS/VISA.

Please allow 7 days for delivery.

Please add carriage. a = £10.35 b = £5.75 c = £1.15 d = £2.30



COMPUTER CONCEPTS SOFTWARE:

	Ex VAT:	Inc VAT
Inter-Word The Word Processor	£ 47.50	54.97c
Spell-Master Ultimate Spelling Checker	£ 50.00	57.50c
Inter-Word & Spell-Master & Master Cartridge.		
Interbase Database	£ 60.00	69.00c
The Complete Word-processing package	£ 97.00	111.55d

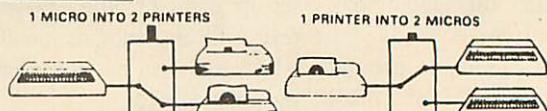
MONITORS/TV MONITORS FOR MASTER OR ARCHIMEDES:

Phillips 8833	£ 252.20	290.03a
Monitor TV Tuner, AV700	£ 65.00	74.75b
TV/Monitor, 10 channel 1010	£ 228.00	262.00a
Remote TV/Monitor 1210	£ 243.00	279.45a

READYMADE LEADS:

Centronics to Centronics	1.5mt @ £ 11.00	12.65c
Disc Drive Data (Single)	1.2mt @ £ 6.00	6.90c
Disc Drive Data (Dual)	1.5mt @ £ 8.00	9.20c
Disc Drive Power (Single)	1.2mt @ £ 3.00	3.45c
Disc Drive Power (Dual)	1.5mt @ £ 5.00	5.75c
Printer (BBC to Centronics)	1mt @ £ 6.00	6.90c
Printer (BBC to Centronics)	1.5mt @ £ 7.00	8.05c
RGB 6-7 pin DIN (Hitachi)	1.2mt @ £ 6.20	7.13c
RGB 6-7 pin DIN (Ferguson)	1.2mt @ £ 6.20	7.13c
RGB 6 pin to SCART (Euro)	1.2mt @ £ 8.20	9.43c
User Port Extension Skt to Plug	5mt @ £ 9.00	10.35c
Printer Extension Skt to Plug	1mt @ £ 10.20	11.73c
1MZ Bus Extension Skt to Plug	3mt @ £ 10.40	11.96c
Many other cables available.		

SWITCHING UNITS:



BBC Printer 2 to 1 (Inc Lead)	£ 29.00	33.35d
BBC Printer 6 to 1	£ 71.00	81.65d
Centronics 2 to 1 (Inc Lead)	£ 33.00	37.95d
Centronics 4 to 1 (Inc Lead)	£ 70.00	80.50d
Centronics 2 to 2: x switches	£ 70.00	80.50d
Printer 2 to 2 'CPX2 Fully Buffered'	£ 60.60	69.69b
User Port 2 Way & Off Posn (Inc Lead)	£ 33.00	37.95d
User Port 6 Way & Off Posn (Inc Lead)	£ 72.00	82.80d
RGB Switcher 2 to 1	£ 20.20	23.23d
RS423 2 to 1	£ 20.20	23.23d

MORLEY ELECTRONICS PRODUCTS:

Teletex Adaptor ATS Software on ROM	£ 86.94	99.98d
Epron Programmer Software on ROM	£ 30.00	34.50d
Care Deluxe Epron Programmer capable of programming CMos & Standard Eproms 2716, 2732, 2764, 27138 & 27256 Software on ROM	£ 33.00	37.95d

Micro on a diet

Your micro could help you live a bit longer. *Healthy Living* is a disc-based program which analyses your diet for energy, protein, carbohydrate, fat, minerals and vitamins.

The package has been put together by Epsilon Software, based on guidelines by the National Advisory Committee on Nutrition Education, an expert body concerned with producing guidelines on nutrition for the general public.

You tell the program what you eat and it calculates the amount of fat and saturated fat in your diet, measured as a percentage of the food intake, and also works out the quantity of fibre in the diet.

The results are compared with recommended values. Possible problems and deficiencies are highlighted and advice given about how to correct imbalances. Costs £12.99.

Professional View is a Pipe Dream

Any similarity between *View Professional* and *PipeDream* running on Clive Sinclair's Z88 portable is entirely deliberate.

They are, indeed, the same product, written by Colton Software, set up by Mark Colton (the original author of *View*). *View Professional* and *PipeDream* files are completely compatible. Sinclair's company, Cambridge Computer, will be marketing a connecting cable and transfer software to swap files between machines.

Teletext Logo

You can now use Logo to create teletext screens. Logotext is an extension to Logotron's version of the language which adds commands to control coloured text and graphics. The package is available from Redbridge Semerc. Tel: 01-478 6363.

Arc star attraction at Barbican centre

The star of this year's *Acorn User* show was undoubtedly the Archimedes. This was the first time the public had been able to see Acorn's supermicro, and crowds around the Acorn stand showed how much interest there is in the machine.

The show was opened on the trade and education day by Government minister John Cope, who is, among other things, responsible for small businesses.

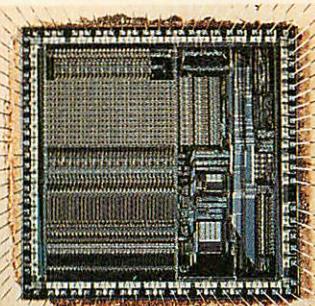
Acorn attracted another large crowd when Roger Wilson, the man behind the RISC system and a rare sight outside the Acorn offices, gave a seminar talk on the Archimedes.

■ Advanced Computer Products had several new products on show, including the launch of the Advanced Quarter-Meg RAM (reviewed in this issue), the AP6 and Hybrid's Music 5000 running on the Electron.

The software for the synthesiser wasn't quite finished.

ACP is busily converting from mode 7 to mode 6 screens. But the Music 5000 itself was working perfectly.

The AP6 is ACP's latest add-



RISC chip: star of the show

on for the Electron. It boasts six sideways ROM sockets and plugs directly into the ACP Plus One. Owners of the older Acorn Plus One will need to get it adapted.

The basic unit should cost under £50. Two later options will include using two of the sockets for sideways RAM, and having these battery backed.

■ An auction at the post-show

party raised around £250 for the Centre for World Development Education. And another auction held live over Micronet brought in a further £228.

Several companies donated items, including a snooker cue signed by ace player Neil Foulds and generously given by Nazir Jessa of Watford Electronics. Nazir was equally generous in buying it back again for £145! Most of the other items were bought by Scots. Kenneth Hobbs of PMS wound up with a keyboard cover, while programmer Derek Mathieson bought an *Acorn User* front cover that never actually appeared. We threw in some BBC paper cups and the toothbrush previously belonging to show organiser Mike Kiy.

John Stewart of the Computer Depot dipped into his pocket for a bottle of House of Commons whisky, while SJ Research's Kim Spence-Jones bought a telephone.

Sentinel to queen's knight four

Model maker Peter Clements, famed for his miniature BBC micros featured in *Acorn User* January 1986, as well as for his Sentinel badges, and has just completed his latest masterpiece - a complete chess set based on the characters in the best selling *Sentinel* game from British Telecom's software house, Firebird.

A total of 600 hours painstaking labour went into the set. Pete, whose work is soon to be featured in *Creative Review*, has represented the king by the Sentinel, the queen by the robot, the bishop by the sentry, the knight becomes a meanie



Pete Clements' *Sentinel* chess set

and the rook is transformed into three boulders. Finally the pawns are played by trees.

Pete, who also designed the AMX Mouse badges seen at the

AU show, says the set is a one-off and not for sale - although if someone offered him the price of an Archimedes he might reconsider!



ALL PRICES EXCLUDING VAT

BBC Compatible Disc Drives

COMBO C

– 3½" plus 5¼" combination drive in 802C case
without PSU

MD802F

– Dual 800K drive 3½" 40/80 track switchable

HD2000

– 20MB Winchester built into MD802E case with independent
PSU Using ADFS including Winchester controller card and
BBC host adaptor card

UFD2000

– 20MB Winchester and IBM floppy disk drive 40/80 track
switchable housed in MD802DM case



AKHTER

GROUP PLC.
TELEX 818894 AKHTER G

AKHTER HOUSE, PERRY ROAD,
HARLOW, ESSEX CM18 7PN, UK
TEL: HARLOW (0279) 443521

Dealer Enquiries
Welcome

Cut-price database

A new company has launched itself on to the Acorn software market with a database for less than a tenner.

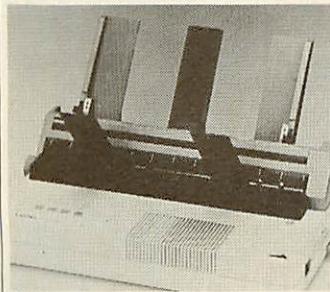
Raycomp has produced several versions of the database to make maximum use of extras like sideways RAM, second processors and shadow RAM. All machines are catered for, from the Electron to the Master Turbo, and an enhanced Archimedes version is planned for future release.

Anyone who buys the software and then needs to switch to a different system can have the data transferred at 'nominal' cost, according to Raycomp.

A separate graphics utility has also been launched which is capable of generating a variety of graphs and charts from the information in the database. The utility disc costs £7.50.

News in brief

■ *Wizard* is a new bulletin board with a few unusual extras. As well as mail services and message areas, the board offers credit and company check facilities and an agency service for private investigators. The board is on (0703) 631431 between 6pm and 12pm.



Brother's new printer

■ Brother is aiming to take more of the high quality printer market with its 1724 model. This 24-pin dot matrix has a speed of 216 characters per second in draft mode, with letter quality printing at 72 cps. The price is £695. Contact Brother on 061-330 6531.

PMS launches Genie upgrades

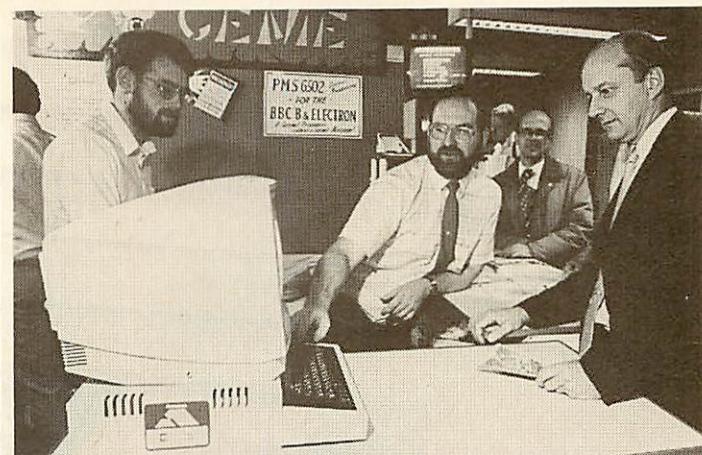
Permanent Memory Systems had a busy *Acorn User* show as many took the opportunity to get their hands on *Genie*, the package of pop-up utilities.

PMS used the show to launch upgrades and additions to the system. A version of *Genie* has been launched for Master owners. It comes in the Care Electronics cartridge which makes it simpler and less prone to damage when moving the package frequently from machine to machine.

There's an option of having 16k or sideways RAM in the cartridge. This is used like the RAM banks in the Master. The *Genie* cartridge costs the same as the standard model - £80. The sideways RAM is another on the top of that £15.

All *Genie* models now work with real time clocks in BBC Bs. Previously, unless you were using a Master you had to enter the time manually, now it's read automatically.

If you haven't got a clock, PMS can now supply one. The *Genie* Watch looks similar to a 32k ROM chip, and costs £29.90 to registered *Genie*



Genie commands the attention of trade and industry minister John Cope

owners (an extra £5 to everyone else). Also new is a utilities disc. This contains all the routines that had to be left out of the *Genie* ROM because there wasn't enough room.

The programs allow you to transport data to and from wordprocessors and databases. And there are new printout options, including label printing from *Genie*'s address book and week and month planners from the desk diary. The disc is available at £9.95.

Several companies used the exhibition to show-off software and hardware for the

Archimedes - not all of it ready. Watford Electronics had an impressive real-time digitiser. The full game version of *Lander*, known as *Zarch*, was on the Superior stand, although in pre-production form.

AMS had the front end of its art package, *Finesse* on show. A fully working version is expected soon.

Minerva had a fully working version of its *Delta Base* package, complete except for the manual. And Computer Concepts had a new version of *InterWord* running under the 6502 emulator.

Customised chips

KM Sofware is offering a customised ROM service. You tell the company which utilities you want, and it will put them into a single chip.

A list of the utilities available is being compiled at the moment, but will include memory editors, disassemblers, ROM handlers, disc sector editors and programs for tape to disc transfer and formatting.

The cost is 25p for each 256 bytes of code (maximum 15k).

Interspan ready

User trials of Interspan, the electronic mail system launched by the directors of SJ Research, have now been completed and the company says it is ready to launch the service.

Following comments from users at the test sites, slight modifications have been made to the software. Further upgrades are likely, and will be supplied by sending the software direct using the Interspan system itself.

The service is unusual in that

it phones the users, rather than the other way around. The main strength, according to the company, is that the system is based on the concept of sending and receiving file, rather than just text.

This makes it easy to transfer programs and data, as well as messages. Interspan is also one of the first British electronic mail systems to comply with the X.400 international standards, which were designed with file transfer in mind.



ALL PRICES EXCLUDING VAT

BBC Compatible Disc Drives

MD400B

– Single 400K drive 40/80 track switchable, Double Sided, with PSU

MD400F

– 3.½" Single 400K drive, Double Sided

MD802E

– Dual 800K drive, 40/80 track switchable, vertically stacked, with PSU

MD802DM

– Dual 800K drive 40/80 track switchable, horizontally mounted in Monitor Stand, with PSU



AKHTER

GROUP PLC.
TELEX 818894 AKHTER G

AKHTER HOUSE, PERRY ROAD,
HARLOW, ESSEX CM18 7PN, UK
TEL: HARLOW (0279) 443521

Dealer Enquiries
Welcome

Contacts

Cambridge Computer, Sydney House, Sussex Street, Cambridge CB1 1PA. Tel: (0223) 312216.

Camelot Computer Services, 14 South View, Woodley, Stockport, Cheshire SK6 1PD. Tel: 061-494 2253.

Epsilon Software, 45 Wych Hill Park, Woking, Surrey GU22 0HE.

Intersearch Systems, New Hall, The Street, Tendring, Essex CO16 0BL. Tel: (0255) 831011.

Interspan, 108 Mill Road, Cambridge CB1 2BD. Tel: (0223) 316686.

KM Software, 39 Clos des Ormes, Rue Verte, St Lawrence, Jersey, Channel Islands. Microlink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY. Tel: 061-456 8383.

Permanent Memory Systems, 38 Mount Cameron Drive, East Kilbride G74 2ES. Tel: (3552) 32796.

Raycomp, 46 Frenchs Avenue, Dunstable, Bedfordshire LU6 1BH.

XOB, Balkeerie, Eassie, Forfar, Angus DD8 1SR. Tel: (0307) 84364.

Focus on business in AU

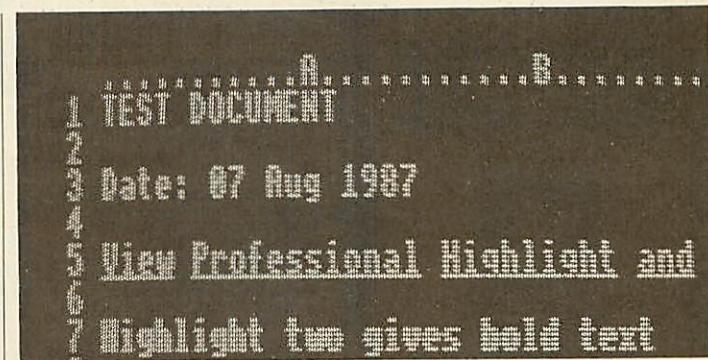
November is our business special with features on:

VIEW PROFESSIONAL: Why use it? Rob MacMillan examines possible applications for Acorn's combined word-processor and spreadsheet.

LONG MACROS: Mailshots can be a problem when using View's macro facility. We explain how you can solve it - using ViewStore.

JOE'S JOTTINGS: Getting your micro to do real work is Joe's theme, as he shows you how to build a light meter and a toolbox of useful utilities.

INTER-BASE: Bruce Smith



View Professional: a closer look

asks whether the wait was worth it.

EPSON LQ-800: Why buy a laser printer when you can get nearly as good quality with a

dot matrix? We look at Epson's top notch 24-pin printer.

PLUS there's a review of *Halcyon*, an expanded Comms Column and all the regulars.

Blunderbox

In the *Genie* competition in September, *AU*, there was a mistake in the second column of the table. The value 020B should read 0208. Thanks to Nicholas de Bunsen who spotted it. Also, the September First Byte listing 3 contained an error. Line 160 should be:

160 PRINT ~?addr
and line 140 should be deleted. Thanks to Cameron Marshall for pointing this out.

Diary dates

The show season is now underway with exhibitions for all types of technology. The fifth Computers in the City event will take place at the Barbican Centre from November 17-19. The exhibition will be looking at the latest developments in computer-based financial systems from over 100 exhibitors.

The National Exhibition Centre in Birmingham plays host to the Design and Tech-

nology Exhibition on October 15-17. And the Dutch Big Ben club has its annual BBC micro show on October 10 in Harderwyk, in the Netherlands.

Copy cost

So many people have been asking for photocopies of past articles that we've decided to streamline the process. In future, all photocopies will cost £2 per article or review, regardless of the number of pages.

POST A PROBLEM

Acorn User has a guaranteed fast reply service for enquiries. Your answer will be returned within 10 working days for just £3 (includes VAT), or your money back.

Just write out your problem, fill in the coupon (right), and send both off to *Acorn User* with a stamped addressed envelope and cheque or postal order for £3. If you want recorded delivery add the cost of this on. Include as much detail as possible, and a disc or cassette if a program is involved, with enough space to record any corrected listing.

Please note: debugging readers' programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the service will only be able to make general comments or suggest a strategy for the reader.

We will then answer the problem and return all material received - within a guaranteed 10 working days from receipt. If we fail to match this promise then your cheque or postal order will be returned with the answered question - you can't lose!

ACORN USER READER SERVICE
141-143 Drury Lane, London WC2B 5TF

NAME _____

ADDRESS _____

POSTCODE _____

DAYTIME PHONE NUMBER _____

I enclose a cheque/postal order for £3 and an SAE with my problem.

OFFICE USE ONLY Date in:

Date out:

Answered by:

TWILLSTAR COMPUTERS LTD

WINTER CATALOGUE OUT NOW! FREE Phone and get your issue.

Computers



ARCHIMEDES HIGH PERFORMANCE COMPUTER SYSTEMS

Archimedes systems use the Arthur operating system, a new version of the BBC Micro operating system. BBC BASIC is replaced by a new extended version, BBC BASIC V. The speed and power of Archimedes allows the programmer to exploit RISC architecture with a range of high level languages for scientific engineering and business uses. In addition to BBC BASIC V, Acornsoft's development languages include C, ISO-Pascal, FORTRAN, Lisp and Prolog. The Acornsoft Software Developers Toolbox provides utilities to simplify program development and debugging; while an extensive Software Developer's Debug Tool facilitates high level language development in C, Pascal or FORTRAN. All Archimedes Systems have a floating point emulator as standard. On the 400 series, complex mathematical calculations can be further enhanced by the addition of a floating point unit (FPU). All machines have feature: 32 bit RISC technology - BM enhanced style keyboard with 3 button mouse - BBC Micro style operating system (Arthur) - BBC BASIC V - interfaces: printer, serial, monitor, stereo sound - ECONET plug-in option - a variety of modules can be fitted. Archimedes is an open system and its flexibility is achieved by fitting any of the following modules (peripheral modules) via a back plane: hard disk controller (300 series only) - ROM extension board - MIDI music interface - MS-DOS co-processor - SCSI - hardware floating point unit - Ethernet module.

THE 300 SERIES Consists of two models, Archimedes 305 0.5 Mbyte of RAM and Archimedes 310 with 1 Mbyte of RAM. Both machines have a 512 Kbyte ROM and a 1 Mbyte (unformatted) 3½" disc drive.

THE 400 SERIES Offers increased expansion capabilities. The Archimedes 410 has 1 Mbyte of RAM. 1 Mbyte (unformatted) 3½" disc drive, a hardware floating point unit option, a co-processor bus, a hard disk controller, a four socket back plane, 512 Kbytes of RAM. At the top of the range is Archimedes 440. This machine possesses all the features of the 410 as standard, with the adoption of 4 Mbytes of RAM and a 20 Mbyte hard disk.

305 BASE AKB10	918.85
305 & mono monitor	976.35
305 & colour monitor	1148.85
310 BASE AKB15	1006.25
310 & mono monitor	1063.75
310 & colour monitor	1236.25
410 BASE AKB26	1608.85
410 & mono monitor	1666.35
410 & colour monitor	1838.85
440 BASE AKB20	2643.85
440 & mono monitor	2701.35
440 & colour monitor	2873.85
Archimedes/Master Econet	49.99
0.5 MB RAM	102.35
Floppy disk	143.75
20 Mbyte hard disk & podule (300 only)	573.85
Podule Backplane	40.25
ROM Podule	TBA
I/O Podule	TBA
MIDI add-on to I/O	TBA
A series reference manual	£19.95

MASTER 128

Complete With Internal Software £399.00
Master Turbo Upgrade £113.95
Master Econet Module £46.00
Master ET £349.00
Master 512 Upgrade £217.35

The Master 512 upgrade board incorporates the Intel 80186 processor, plus 512K bytes of RAM. Digital Research DOS+ which is compatible with both MS/DOS version

2, and CP/M 86, allows you to run a large proportion of the most useful programs available. A dual 80 track disc drive is required to run programs on the 512. Provided free with 512 upgrade board are three GEM packages, GEM Desk Top, GEM Write, GEM Paint.

UNIVERSAL SECOND PROCESSOR
This allows you to connect co-processor boards designed for the Master Series to your BBC Models B or B+. Fitting a Turbo board boosts the BBC's already rapid performance to twice the speed of the standard processor. Fitting the 512 co-processor converts the BBC micro into a 16 bit machine, opening up new possibilities within the world of MS-DOS and CP/M 86.
£86.25
Epson Cartridge £14.95
Reference Manual Part 1 £14.95
Reference Manual Part 2 £14.95
Acorn Teletext Receiver £108.00

FILESTORE

Filestore provides shared access to file and printer services on Econet. The filestore consists of two units - a dual 3.5 inch floppy disc unit 1.2 Mbytes of storage (Filestore E01) which can be expanded with a high performance 20 Mbyte Winchester disk drive unit (Filestore E20).
FILESTORE E01 £952.00
FILESTORE E20 £829.00

ECONET ACCESSORIES
100m Cable £89.00
Station Lead Set £29.00
Econet Starter Kit £99.00
Econet Bridge £199.00
Level 1 Fileserver 40 Track £99.00
Level 2 Fileserver 80 Track £235.00
Print Server Eprom £49.00

BBC Upgrades

64K Upgrade Kit £39.95
17/20 Upgrade Kit £49.94
ADFS ROM £29.95
Disc Upgrade Kit £65.00
Econet Upgrade Kit £49.00
DNFS ROM £20.00

WORD PROCESSING SPECIAL PACKAGE

PACKAGE 1
Based on Master 128. The Twillstar All in One Word Processing Package contains a Master 128, View 3.0, Viewsheet, High Res Green Monitor, 800K Dual Drives with PSU, Quendata Daisy Wheel Printer together with a box of Discs, Paper, and all the Cables. £899.00

PACKAGE 2
Based on Master Compact 128. The Twillstar package includes Compact 128, latest version of the View Word processor, single 640K disk drive, monochrome monitor, correspondence quality printer. All connecting cables for above and also 5 disks and some paper. £635.00

BBC Master Compact

Twillstar continues to offer the MASTER COMPACT for your Home Education and Business needs! Complete with bundled software and an integral 3.5" Disk Drive in the following Systems:-

ENTRY SYSTEM £299.00
128K "Single 640K Drive" * bundled software*

TV SYSTEM £325.00
128K "Single 640K Drive" * UHF Modulator* *Bundled Software*

MONO SYSTEM £369.00
128K "Single 640K Drive" * Bundled Software* *12" High Res Monochrome Monitor*

COLOUR SYSTEM £499.00
128K "Single 640K Drive" * Bundled Software* *14" Medium Res Colour Monitor*

SPECIFICATIONS: ★ Compatible with Master Series micro subset ★ 128K RAM inc 64K sideways RAM ★ 64K ROM inc 32K MOS, 16K BASIC ★ Up to 4 internal ROM sockets ★ 3.5" 640K formatted disk drive ★ **OUTPUTS:** Video/RGB/Printer/ Mouse or Joystick ★ Disk drive ★ (optional) Econet ★ Serial ★ 5V power from disk drive module ★ Usual 8 BBC display modes inc. Mode 7 ★ **BUNDLED SOFTWARE:** Pull down menus ★ Desk top inc. note pad, calculator ★ VIEW 3.0 ★ CARD INDEX ★ FULL LOGO ★ BBC BASIC 4.0 ★ ADFS + Utils ★ Welcome suite ★ Tutorials ★ (1770 DFS under licence)
2nd DRIVE KIT £113.00

Monitors

MONOCHROME MONITORS

Phillips BM 7502
12" hi res. P31 Green Phosphor Screen, CVBS input. Audio input. Band width 20 MHz. 2000 CHRIS Display. Adjustable viewing angle. £79.00

Phillips BM 7522
Amber Screen £95.00
Phillips BM 7542
Dedicated WD phosphor Screen monitor £95.00

Philips BM 7513
12" Green IBM compatible £120.00

TAXAN
New Taxan Monochrome Screens
Taxan KX117
12" Green Screen P31 £89.00
Taxan KX118
12" Green Screen P39 £99.00
Taxan KX119
12" PUL Amber Screen £99.00

COLOUR MONITORS

Microvitec 1431 Std Res £201.25
Microvitec 1451 Med Res £255.00
Microvitec 1441 Hi Res £391.00
Microvitec 2030 Cs 20 Std Res £425.50

Microvitec 1431 AP Std Res £224.25

Microvitec 1451 Ap Med Res £293.25

PHILLIPS

New from Phillips
Phillips CM8833
14" CVBS and RGB medium resolution colour monitor. IBM PC compatible. Fast blankup to enable superimposing. Stereo Audio. Ear phone socket. 600 dots x 285 lines vertical £269.00

Phillips CM8852
14" RGB professional med res colour. 700 dots x 285 £289.00

Phillips CM8873
14" RGB high resolution colour monitor Res 850 x 480 £550.00

Taxan Super Vision 620

High Resolution colour monitor with several unique features, at an affordable price.

SUPERVISION 620

12" RGB High resolution colour monitor. Fully compatible with IBM, Apple, BBC and most other Personal Computers. 635 x 312 line resolution. Positive or negative sync input. Text colour switchable to green, amber, white or blue or inverse white. Super high contrast tube. Optional tilt-swivel base (with clock/calendar available). Special introductory offer. £299.00

NEW SUPERVISION 625
12" high resolution colour monitor. 661 dots x 312 lines £369.00

MONITOR TO TV CONVERTER
AV 7300 Colour tuner module Push button control. 12 preset channels. Built in aerial. Compact design. Composite video only £69.00

Mitsubishi 1404 Medium Resolution Monitor with 640 X 200 Pixels RGB available with IBM or BBC Leads. £249.00

Disc Drives

MITSUBISHI DISC DRIVES

User Friendly Disk Drives 100% BBC compatible slimline disc drives. All drives are supplied complete with formatting diskette, comprehensive users manual and all necessary cables. All drives are 40/80 Track switchable at the front and have two years warranty.

5½" Drives without P.S.U.

MD 400A Single 400K Double Sided £118.00
MD 802C Dual 400K Double Sided £219.00

5½" Drives with P.S.U.

MD 400B Single 400K Double Sided £135.00
MD 802D Dual 400K Double Sided £249.00

SPECIAL

MD 802D Dual 400K Drives horizontally mounted in a monitor stand to fit both the BBC B and the Master series. £269.00

SOURCE DISK DRIVES

Source SD35 3½" disk drive, single drive £85.00
Source SD352 3½" dual drive £149.00

Supplied cased complete with cables, powered from computer. Extended two year warranty.

Source SD35S 3½" single drive with P.S.U. £135.00

Source 352S 3½" dual drive with P.S.U. £199.00

Source SD3545S Combo dual 5½" and 3½" drives with P.S.U. £249.00

Winchester Disk Drives

WINCHESTER DISK DRIVES

Source HD20 Twillstar's 20 Mbyte winchester drive including Acorn DFS ROM complete with P.S.U. £59.00

Source HDP201 Twillstar's 20 Mbyte winchester drive and a 400K double sided floppy drive built in a plinth to accomodate monitor on the top and the computer underneath. Includes ADFS ROM and P.S.U. £869.00

Source TS10 10 Mbyte tape streamer backup unit with utilities £695.00

Other size hard disks are available, please call for our latest prices.

Accessories

Taxan KIF 4308 buffer compatible with any Centronics interface printer £149.00

Further 64k upgrade available.

Printer/Computer sharers. 2 - 1 £39.00
6 - 1 £79.00

Serial and Parallel T Switches
Parallel T switch £67.85
Serial T switch £67.82

FLOPPY DISKS

Raven 5½" pack of 10 in a clear library box £15.00

Raven 5½" rainbow colour pack of 10 in library box £17.00

Raven 3½" single sided pack of 10 in library box £18.00

Raven 3½" double sided pack of 10 in library box £25.00

LOCKABLE STORAGE BOXES

Trackmaster 5½" 70 x 5½" lockable £7.95

Trackmaster 5½" 100 x 5½" lockable £9.95

Trackmaster 3½" 40 x 3½" lockable £6.95

Trackmaster 3½" 100 x 3½" lockable £9.95

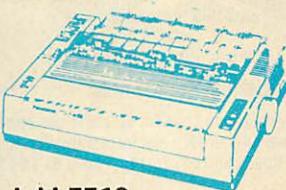
YOUR ONE STOP MEGA-COMPUSTORE FOR HOME, EDUCATION & BUSINESS NEEDS!

Printers SPECIAL OFFER

SAVE £29.00

FREE PRINTER STAND
FREE BBC CABLE
200 SHEETS OF PAPER

When you buy a
Panasonic KX-P1081 The
faster and enhanced KX-P1081.
120 cps in draft mode. 24 cps
in NLQ mode. Fully Epson RX80
and IBM Matrix and Graphics
Printers compatible. Standard
friction and tractor feed.
Operator accessible print mode
switch. Standard 8 bit parallel
interface. RS232 interface
is optional £179.00



Juki 5510
- Gives you 180 CPS &
NLQ Standards £269.00
Compatible with both the Epson and
the IBM Graphic Printer. Standard
2K memory (expandable to 14K)
built-in Parallel Centronics interface
and 8-switch international character
sets.
If you need colour too, the optional
Juki 5510 Colour Kit gives you seven
colours. £112.00

EPSON PRINTERS
Epson FX 800 and FX 1000 range offers
superior printing and technical
features. 200 cps in draft and 40 cps in
NLQ. Complete with tractor and friction
feed as standard. Offering IBM
compatibility, full graphics. Also
includes two NLQ fonts, 10,12,17 and
20 cps, double height and double width
with 8K buffer built in.

FX 800 £369.00
FX 1000 £499.00
FX 800 Sheetfeeder £141.00
FX 1000 Sheetfeeder £163.00
Epson EX 800/1000 High speed
printers. 300 cps in 12 cpi mode. Also
offers four colour printing.
EX 800 £465.00
EX 1000 £626.75
Colour option for both £62.00



JUST RELEASED

Epson LX 800
120 cps Epson & IBM compatible. Near
letter quality. Standard centronics
interface complete with tractor feed
£229.00
Epson LQ 800 £499.00
Epson LQ 1000 £669.00

CREDIT FACILITIES

Full credit facilities now
available nationwide
* **LOW DEPOSITS**
* **FAST FRIENDLY SERVICE**
* **UP TO 3 YEARS TO PAY**
Call for further details
Typical APR 36.3%

CANON PW1080A

80 column printer with 160 cps draft
and 40 cps NLQ with built in friction
and tractor feed. Fully compatible
with Epson FX80. Standard parallel
interface. £249.00

CANON 55A

Wide version. Fully IBM
compatible. £399.00

STAR NL-10

Fine Near-Letter-Quality, 100%
compatibility and total
reliability all in one easy to use
printer. £229.00

STAR NX-15

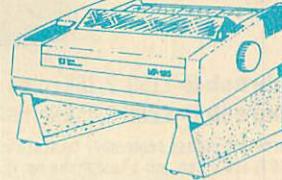
Same as Star NL-10 but with 136
column width. Both Epson and IBM
compatible. £399.00

MP200

200 cps in draft. 40 cps in NLQ mode.
7K buffer as standard. (128 down-
loadable characters in NLQ) optional
8K memory. IC font cards. £274.85

MICRO P MP165

80 Columns. 165 cps in draft mode.
35 cps in NLQ mode. Ultra high
resolution graphics. Friction and
traction feed. 2 Year warranty. Epson
or IBM compatible control codes.
£199.00



MP201

Same as MP200 with 136 columns
£318.55



MP135

Just released
135 cps, 80 column printer. Friction/
tractor feed. NLQ. Epson & IBM
Compatible £145.00

MP480

New
Fast reliable 480 cps dot matrix
printer. 74 cps, NLQ, 80 column, fully
Epson & IBM compatible, Std
parallel £349.00

TAXAN KXP815

Taxan KXP 815 New enhanced KP
810 with 160 cps and fully Epson &
IBM Compatible £299.00

TAXAN KXP915

Taxan KXP 915 New enhanced KP
915 with 180 cps and fully Epson &
IBM Compatible £420.00

CITIZEN MSP10E

160 CPS Draft and 40 CPS NLQ. With
two years warranty £269.00

CITIZEN MSP-15E

17" wide carriage. 136 column
operating at 160 CPS and at the flick
of a switch will print near letter quality
at 40 CPS. Fully Epson and IBM
compatible. 8K of standard buffer
built in. Standard Centronics are
optional RS232 £379.00

CITIZEN 120D

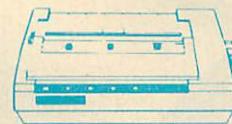
Bringing to the small business,
educational and home user good
quality and attention to detail. Its
compact size, host of standard
features and built in quality and
reliability that supports Citizens
unique full 2 year warranty make it
a must for all computer users. Fast
draft output: 120 cps. Built in NLQ:
25 cps. IBM and Epson compatible.
Plug-in interface cartridge. Tractor
and friction feed as standard.
Optional cut sheet feeder. £179.00

CITIZEN LASER OVERTURE 110

Overture 110 Prints 10 pages per
minute. Comes complete with
internal controller with print
resolution of 300 x 300 dots per inch.
Print capability of Standard Text,
IBM & Epson bit-map graphics, IBM
graphic character set, Epson graphic
character set. Resident fonts are:
Citizen Pica upright/italic, Citizen
Elite upright/italic, Citizen Courier,
Citizen Bookface (over 56 typefaces),
downloadable one character set in
Epson Mode. 11 international
character sets. Standard Centronics
Parallel and Serial RS232C. Standard
512K memory 384-byte user
available. Fully compatible with
Epson FX1000 IBM Proprinter &
Diablo 630. £1850.00

SOURCE

The Complete Solution
TECO VP1814



Dot matrix printer. The VP1814 is fast
highly reliable and easy to operate.
★ Standard 80 column

★ The high-speed, low energy
consumption 9 wire dot head gives
printing speed of 189 cps and NLQ
speed 36 cps

★ Bi-directional, logic seeking in
text mode

★ Fan-fold, roll or cut-sheet paper is
possible with adjustable sprocket pin
feed and friction feed

★ Offers: emphasized, double print,
super script, sub script

★ Justified print modes are also
available including left, centre, right
and full justification

★ 9 graphic modes are available

★ Both download and imprint buffer
can exist simultaneously

★ 7K input buffer standard can be
expanded to 15K

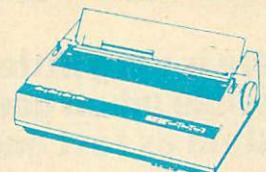
★ Printing modes selectable at front
panel (NLQ/draft, Pica/Elite, enlarge,
emphasize, condense, italic

★ 11 Language international
character font is internalized

★ Both IBM and Epson compatible

MAIN UK DISTRIBUTOR £229.00

DAISYWHEEL



PANASONIC KX-P3131

A Fully Formed Serial Impact
Daisywheel printer with print speed
of 17cps. Diablo compatible print
wheels. Print pitches available are:
10, 12, 15 and proportional spacing.
Standard friction feed and optional
tractor. Paper width 13.5 inches.
Standard Centronics optional RS-
232C. Built with 6K text buffer
expandable to 32K buffer. £289.00

BROTHER HR 20

The new Brother Daisywheel HR 20
8K standard buffer upgradable to
16K. Comes standard with serial and
parallel port £389.00

JUKI Daisywheel

Juki 6100 £329.00

NEW MP26 Daisywheel

MP26 A feature rich very quiet
printer. Universal compatibility with
almost all personal computers at an
unbeatable price. Speed: 26 cps. 132
columns Diablo 630 compatible
£249.00

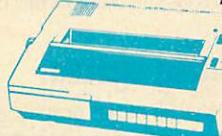
Optional Tractorfeed £95.00
Optional Sheet feeder £145.00

MP40

A very fast, quiet printer with
features and compatible with
virtually all computers at a fantastic
price. 40 cps. 132 column, diablo 630
interface, parallel interface, built in
standard RS232 optional £355.00

GAKKEN GPR-2000

Print speed of 18 characters per
second. Fully Qume compatible.
Takes Qume exchangeable
Daisywheel and ribbons. Selectable
10,12 & 15 pitch. Supports
proportional spacing. Standard
friction feed. Tractor/cutsheet feeder
and serial interface optional.
£169.00



How to Order

You can purchase any of the
items listed. All you have to do
is write your requirements on
a sheet of paper, and we will
despatch your goods within 24
hours, subject to availability.
Please add the following
amounts for Postage and
Packing.

Items below £10.00 add £1.50

Items below £50.00 add £2.50

Items below £100.00 add £3.50

Items over £100.00 add £8.00
(UK Mainland only)

All prices include VAT at 15%

'No Hidden Extras'

Prices correct at time of going
to press but subject to change
without notice.

Please make cheques payable to:

TWILLSTAR COMPUTERS LTD.

Access/Visa Card Holders:
Welcome. Call now on:-
01-571 5938 or 574 5271



Could you produce this advertisement on your Micro?

There is very little that is not possible when you have a graphics system as fast and as powerful as
MICROBRUSH

Microbrush is a professional graphics package for either the BBC B or the Master. Whichever machine you have, Microbrush transforms it into a powerful graphics computer. If you own a Master then Microbrush offers you extended resolution in mode 0 and mode 1.

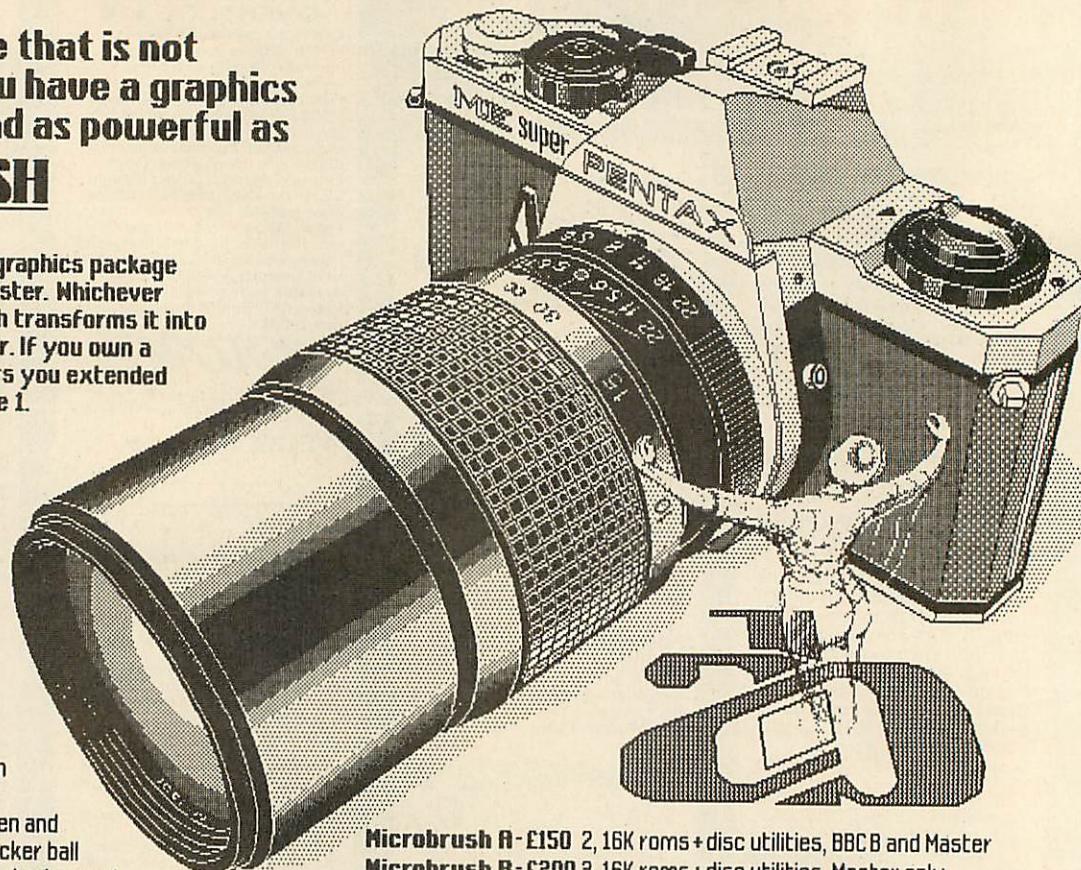
Mode 0 - 1216 * 416

Mode 1 - 608 * 416

This whole A4 page was composed as one mode 0 high resolution image using the out-board scroll system, and has a resolution of 1216 * 900 pixels.

Microbrush for the BBC B is comprised of two 16K roms. The Master version contains a third rom. The first two roms can be used in either machine.

The whole system is menu driven and controlled by the Marconi RB2 tracker ball for speed and precision, but may also be used with either the AMX or the Whigmore mouse. Please note that the tracker ball is not included.



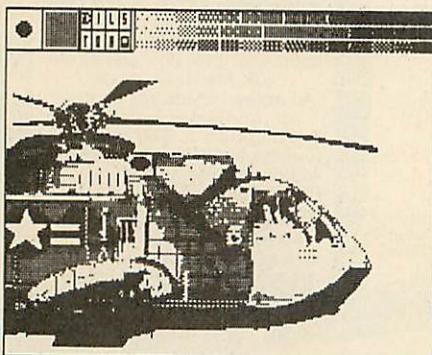
Microbrush A - £150 2, 16K roms + disc utilities, BBC B and Master

Microbrush B - £200 3, 16K roms + disc utilities, Master only.

When ordering please remember to state which system you require, whether you need 40 or 80 track discs and a telephone no. if you have one. Orders and information requests should be sent to AB Designs, 81 Sutton Common Road, Sutton, Surrey. Phone 01 644 6643

The Painting system

This is just 1 of 33 major graphic systems contained within Microbrush and offers you 42 colours in mode 1 and 42 grey tones in mode 0. New colour palettes can be created with which you can draw lines, sketch, fill, paint in foreground, background, opaque, transparent and combined colour. Add this to a colour rubber which will selectively erase any actual colour and you have a very powerful painting system with more than 1,000,000 possible colours.



Above the painting system in mode 0.

The Ikon Generator

The ikon generator is the main workhorse of the Microbrush system as it is used for both generating and positioning any ikon up to 6*3 character blocks. This system is also used

by the typesetter and for creating colour palettes, rubbers, paint-brushes and typefaces. Up to 46 ikons can be stored in memory. The scope of the ikon facility is immense as it allows you to transform the Microbrush system into a purpose built design tool that suits your needs.

The Type Setter

With the Microbrush system you will receive 50 proportionally spaced typefaces. The smallest allows you up to 170 characters to the line and if this is not enough then you can design your own typefaces.

The typesetter displays the current font as a scrollable menu allowing you to quickly produce professional typography.

The Screen Editor and the Special Effects Generator

The screen editor is a powerful drag system that allows you to store up to a quarter of the screen in memory. Once stored, images can literally be dragged across the screen, repeated, copied, saved to disc or fed to the special effects generator.

The Special Effects Generator

This is a very versatile system which will automatically outline, inline, shadow, 3D, half-tone, etc. any image held within the screen editor's memory.

The Injector rom

The Injector rom is the second rom in the Microbrush system. This rom contains the drawing functions such as lines, rectangles, circles, ellipses, arcs, rotate, squash, stretch, zoom, halve and quarter screens, plus a whole host of other functions.

This is a very brief description of just 7 of the 33 graphics systems contained within Microbrush. All of the systems are both fast and easy to access. Microbrush also includes a 7*7 character pixel editor and an Epson FX80 screen dump.

The Master rom

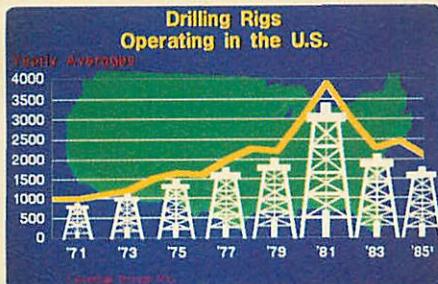
The Master rom takes you into a completely different world of graphics with almost 4 times the resolution in modes 1 and 0, plus 2 on-board graphics screens, 10 rom based typefaces and a 3D generator which is linked to a 10 point perspective system. This allows you to deal with exceptionally complex perspective tasks such as the camera seen above. Also available for the Master rom is an out-board scroll system which allows you to build images with a resolution greater than 1216*2000, plus there are high res. screen dumps for both Epson and Integrex printers.

Lastly flick through the pages of this magazine and see how many of the other graphic systems are capable of producing their own advertising.

Extensions to the Microbrush system include - The out-board scroll system - £40, an extended Master rom offering you 14 colours in mode 1 and 4 colours in mode 0 - £85, a typeface editor plus fifteen extra typefaces - £25, the Master rom - £65. No VAT if purchased before September 1.

What's the colour of your money?

Polaroid



Instant Slide

80p*

£99

The slide on the left was made by a Polaroid Palette computer image recorder in under half an hour for under a pound. The slide on the right was produced by an outside agency for about a hundred pounds more.

It's an odd world when some people are prepared to pay more money to get less and take longer over it.

With Polaroid's Palette you can produce 35mm colour slides, overheads and prints at a fraction of the cost and time. You can also update your information right up to the last few minutes before a presentation. And all along, you're in full control of the colour you want. (And also in full control of who exactly will see the information on the slide. This means it's completely confidential.)

The colour you get from our Palette is the perfect way to add a smooth finish to your presentation. And not paint your bank balance red. For further information fill in the coupon below.



*Based on the cost of origination of twelve slides using Polaroid's new High Contrast Polachrome film.

For further information on the Polaroid Palette computer image recorder return this coupon or call:
Ray Taylor, Polaroid (UK) Ltd, Ashley Road, St. Albans, Herts. AL1 5PR. Tel St. Albans 07072 78283.

Name _____ Position _____

Company _____

Address _____

(AU/10/87) Tel _____

Polaroid
Instant Presentations

Polaroid is a regd. trademark of the Polaroid Corporation, Mass., USA.

For all those who Announcing a competition you

want to win £250 can enter without a coupon,

in the Electronic a stamp or an envelope. All

Yellow Pages you need to do is follow the

competition, here's instructions in the panel oppo-

the answer. site to programme Electronic

Yellow Pages into your  computer. Answer one simple

question, complete the tiebreaker, and you will then stand a

chance of winning £250 or one of the many other cash prizes.

But ours is not the only competition you'll find on Electronic

Yellow Pages. Rivalry is fierce between different plumbers, car

rental companies, builders and other competing advertisers.

Each one can display their latest rates and special offers. So if

you want to compare the prices of several different firms, just

tap a few keys to find the lowest quote. Electronic

Yellow Pages already covers all of London,

Guildford, Reading and Watford. To find out more

about how this new service works, or if you

have any difficulty gaining access, phone our

Helpline on Reading (0734) 506259. And even if

you don't win the competition, you'll still find that

Electronic Yellow Pages offers many rewards.

HOW TO ENTER
First, you must programme your terminal to connect to EYP; if you have a Videotex terminal with a Database Directory, simply add EYP and the appropriate telephone number below to the menu, as shown in the terminal handbook; if you have a Teletype terminal (e.g. a microcomputer) simply set up a profile for EYP using the relevant telephone number and technical settings. If you are not sure how to do this, ask your computer supplier. To gain access, dial the number you've programmed and, once connected, you'll be asked for a user ID number. Simply enter the special competition ID shown below, and follow the instructions.

ACCESS NUMBERS
For Teletype 300/300
Dial: Reading (0734) 586255
Enter ID: 5005
For Teletype 1200/1200
Dial: Reading (0734) 597231
Enter ID: 5005
For Videotex 1200/75
Dial: Reading (0734) 585151
or go to Prestel page 3813
Enter ID: 5006

Like the whole EYP database, entering the competition is free.

TECHNICAL SPECIFICATION
Technical settings for EYP are:

7 data bits, 1 stop bit, even parity
PRIZES:
1st £250; 2nd £100; 3rd £50;
150 consolation prizes of £20.
The closing date for entries is
30th September 1987.





Royal Horticultural Hall
Westminster, London SW1

SEE the first software, hardware and books for the Archimedes from companies like Acornsoft, Clares, Minerva, Computer Concepts, and many others.

BUT THAT'S NOT ALL!

- ★ Hardware and software galore for BBC Micro and Electron owners
- ★ Lots of bargains for the BBC Micro and Electron at rock-bottom prices
- ★ Technical advice from the experts over the whole range of Acorn machines

10am-6pm, Friday November 13
10am-6pm, Saturday November 14
10am-4pm, Sunday November 15

Save £1
a head
with this
advance
ticket order

Here's your
personal invitation
to try out the revolutionary
Archimedes for yourself

Be one of the first to play Zarch, the spectacular new game that is the first to make use of the Archimedes' incredible speed to magnificent effect – the four-directional scrolling really has to be seen to be believed!

Come along and meet the author, David Braben, creator of Elite. Try your hand at the game itself... and prepare to be amazed!

All this – and much, much more – at the 17th record-breaking Electron & BBC Micro User Show.

Please supply:

Adult tickets at £2 (save £1) £
 Under-16s tickets at £1 (save £1) £

 Cheque enclosed made payable to Database Publications Ltd.
 Please debit my credit card account
No.

Total £ _____

Signed: _____
Admission at door:
£3 adults, £2 under 16's

Post to: Show Tickets,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

Name: _____

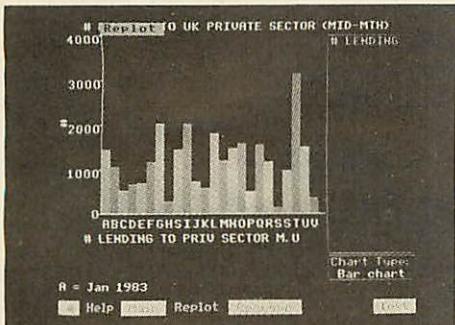
Address: _____



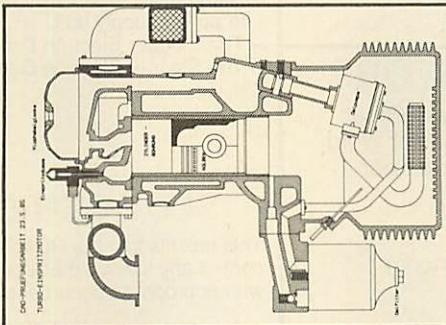
A054

PHONE ORDERS: Ring Show Hotline: 061-480 0171
PRESTEL ORDERS: KEY *89, THEN 614568383
MICROLINK ORDERS: MAILBOX 72:MAG001
Please quote credit card number and full address

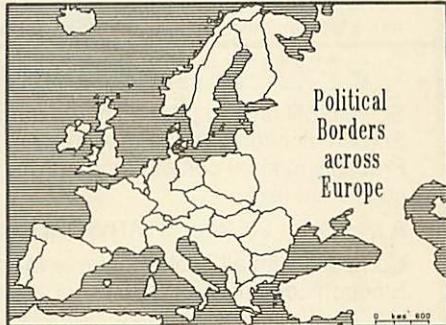
Every PLOTMATE picture tells a story



DOMESDAY
A typical bar chart from the Domesday database. Hard copy is obtainable via the Plotmate BBC Welcome disk.



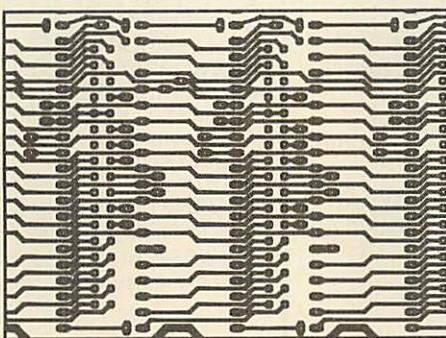
CAD
Example from SUPERDRAFT running on the NIMBUS.



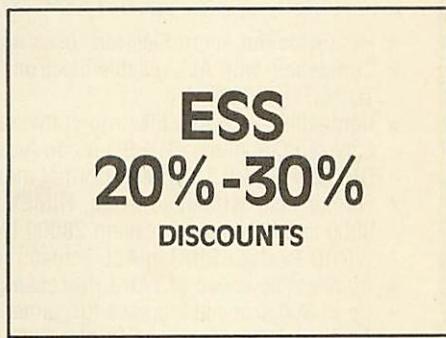
DIGITISING
Map of Europe digitised and edited using LINMAP software.



IMAGE SCANNING
Linscan screen file of 'MONA LISA' incorporated into AMX PAGEMAKER.



PCB DESIGN
Using LINTRACK, a Printed Circuit Board design package.



ESS
Linear Graphic's unique educational discount scheme.

PLOTMATE is one of the most popular graphics plotters used across the entire curriculum in education.

Sophisticated and inexpensive, Plotmate provides high definition plotted output and high resolution scanned input when used in conjunction with the LINSAN Image Scanner.

MICRO COMPATIBILITY

Plotmate is compatible with all leading micros including the BBC, NIMBUS, IBM PCs and PC compatibles, such as the AMSTRAD PC1512.

CAD

Plotmate runs from many leading BBC packages including BITSTIK, AMX DESIGN, the REALTIME GRAPHICS SYSTEM and LOGOTRON LOGO. When the on-board graphics language range is extended, Plotmate 'M' models understand commands from HPGL 7475A/7470A industry standard languages enabling compatibility with a wide range of professional third party software including AUTOCAD, AUTOSKETCH, SUPERDRAFT, SCRIBE MODELLER and MICRODRAFT.

PCB DESIGN

LINTRACK is a sophisticated, low cost, CAD package which allows the creation and revision of printed circuit board artwork. BBC, Nimbus, IBM PC and Amstrad PC1512 versions available.

IMAGE SCANNING

The LINSAN range of image scanners can create image files for most popular Desktop Publishing and Art packages.

AMX PAGEMAKER, FLEET STREET EDITOR, IMAGE, ARTROOM and ACE can process image files created by Linscan (for the BBC).

ALDUS PAGEMAKER and NEWSPAPER can use image files from Linscan (for the Nimbus).

GEM PAINT, XEROX VENTURA PUBLISHER, and GEM DESKTOP PUBLISHER can utilise image files created by Linscan (for IBM PCs and PC compatibles).

DOMESDAY

All Plotmate Welcome disks allow WRITE Files containing tabular data from the Domesday database to be reprocessed in pie, bar and line chart format on the BBC Master.

EDUCATIONAL DISCOUNTS

Linear Graphics offers the unique Educational Support Scheme (ESS) whereby savings of between 20%-30% on all Plotmate plotters, associated software and add-ons are available to all educational establishments. FREE training is offered with quantity orders.



PLOTMATE
LINEAR GRAPHICS LTD

28 Purdeys Way Rochford Essex SS4 1NE
Tel 0702 541663/4/5 Telex 995701

Please send me details on Linear Graphics' products. I am particularly interested in (please indicate)

NAME.....

POSITION.....

ESTABLISHMENT.....

ADDRESS.....

TEL.....

AU10

STARWORD - THE ELECTRON WORD PROCESSOR - NOW ONLY £19.95

ACORN ELECTRON COMPUTERS

These computers are fully tested and guaranteed and can be purchased direct from SLOGGER or through certain dealers. The demand for this computer has prompted SLOGGER to offer both the TURBO ELECTRON and the 64k ELECTRON as well as the standard 32k ELECTRON.

	ONLY
32k Electron	64.00
TURBO Electron (switchable)	85.00
64k Electron (switchable)	99.00

GREEN SCREEN MONITORS

SLOGGER has an offer a limited quantity of Green Screen monitors. These monitors are ideal for Word Processing in 80 column mode giving good clear consistent text.

A MUST for VIEW or STARWORD users.

Complete with all cables suitable for the Acorn Electron computer (or BBC)

Fully tested £79.00 inc carriage.

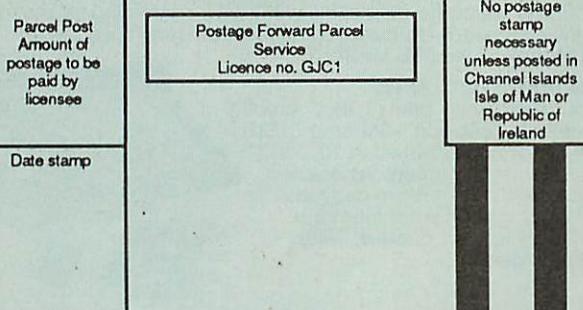
MASTER RAM BOARD

Upgrade your Electron to a 64k Machine using 32k of SHADOW RAM

- ★ Fits inside the Acorn Electron, uses no cartridge ports
- ★ Compatible with ALL reliable Electron hardware (except TURBO DRIVER)
- ★ Compatible with ALL Electron software, switching between 64k mode, TURBO mode (yes . . . the TURBO DRIVER IS BUILT IN), and normal mode.
- ★ For correctly written software, HIMEM is ALWAYS AT 8000 in 64k mode so leaving 28000 bytes for BASIC or WORD PROCESSING in ALL screen modes
- ★ Doubles the speed of Word Processing
- ★ Up to 300% speed increase for games
- ★ Additional 12k for use as Printer Buffer with Expansion ROM 2.0
- ★ 64k Mode fully compatible with 98% of Level 9 BBC Adventure games
- ★ NEW OS 2.1 - PLAY ACORNSOFT'S ELITE with SLOGGER'S JOYSTICK INTERFACE
- ★ Fits inside the Acorn Electron, requires no additional hardware
- ★ Compatible with ALL electron software (except TURBO DRIVER)
- ★ Installation Service for those not confident of soldering

"I can thoroughly recommend it," . . . Electron User 1987

Master RAM Board kit -
code MR2 - Now only £49.95



SLOGGER LTD
107 RICHMOND ROAD
GILLINGHAM
KENT
ME7 1BR

SEDS

THE COMPLETE DISK SYSTEM UPGRADE

Imagine . . . 400k of memory instantly available . . .

Games loaded in seconds . . .

Word Processing files loaded or saved in seconds . . .

BASIC programs loaded or saved in seconds!!!

This is the power of the disk system.

Requiring either the ROMBOX PLUS or the ACORN PLUS 1, SEDS is comprised of the following:

- High quality 40/80 switchable double sided 5 1/4 inch, BBC compatible drive with built in power supply unit.
- The Slogger Electron Disk Interface (SEDI)
- The Slogger Electron Disk Filing System (SEDFS)

SEDS ONLY £199.95

SEDI

SLOGGER ELECTRON DISK INTERFACE

This unit fits into the ROMBOX PLUS or ACORN PLUS 1 and provides the signals to control any standard 5 1/4 or 3 1/2 inch drive. Supplied complete with SEDFS installed with appropriate documentation.

SEDI ONLY £74.95

SEDFS

SLOGGER ELECTRON DISK FILING SYSTEM

- ★ FULLY ACORN DFS compatible
- ★ OSWORD 7D, 7E and 7F implementation
- ★ FORMAT and VERIFY and other utilities built in
- ★ Page E00 . . . NO LOSS OF ELECTRON MEMORY
- ★ OPT commands for faster drives
- ★ FULLY compatible with BASIC Filing system commands
- ★ FULLY compatible with machine code programs
- ★ TAPE to DISK available (T2SEDFS)
- ★ Excellent comprehensive 90 page documentation.

"SEDFS is so good that I can't easily find fault with it, the manual is quite simply the best of the type I have seen, to suit everyone from the beginner to the professional."

"The SEDFS performed admirably throughout . . ."

"Anyone considering upgrading disks, SEDFS is the logical choice."

"I can recommend SEDFS unreservedly" . . . Electron User, June 1987

THE ELK TURBO DRIVER

(Designed by Andyk Ltd)

RUNS ELECTRON SOFTWARE AT SPEEDS
COMPARABLE TO THE BBC

- ★ Doubles the speed of Word Processing.
- ★ Up to 300% speed increase for games.
- ★ Fitted internally - occupies no cartridge ports.
- ★ Switchable "Normal/Turbo" speed.
- ★ Compatible with ALL existing hardware and software products (except the Master RAM board).
- ★ Installation service - for those not confident of soldering.

"This upgrade should be standard on all Electrons"
Electron User, July 1986

Turbo Driver Kit - code TD2 - only £29.95

Installation Service

- ★ Guaranteed to upgrade your Electron with either the Master RAM Board or Elk Turbo Driver AND RETURN IT WITHIN 7 DAYS OF RECEIPT.
- ★ Includes Postage paid BOTH WAYS (using FREEPOST) and 1 YEAR'S GUARANTEE.

PLEASE NOTE . . . if you own a PLUS 1, please send it with your Electron to be tested to ensure reliability at high speed.

ACORN PLUS 1s

Slogger has an offer a limited number of Acorn PLUS 1s. These units are brand new but nonetheless fully tested in Slogger's factory.

ONLY £44.95
(£50.00 with EXP ROM 2.0)

NEWS FOR OPUS DDOS AND CHALLENGER OWNERS

ROMBOX PLUS

SLOGGER's answer to PLUS 1

Q. Why not buy the ACORN PLUS?

A. Because, "excellent though the PLUS 1 is, I think there is still room for improvement" said the Electron User magazine.

The ROMBOX PLUS has this improved specification:

- Four ROM/RAM sockets to free the cartridge slots for more important add-ons. Each socket can take the usual 8K/16K ROMs but can also take 16K RAMs offering a staggering 64K SIDEWAYS RAM.
- The PLUS 1 cartridge slots.
- The PLUS 1 centronics printer port.
- The Expansion ROM 2.0
- Switched Joystick interface available.
- Analogue Joystick interface still under development.

Still only £54.95

SLOGGER EPROM CARTRIDGE

- Carries TWO 8k/16k ROM/EPROM software
- Compatible with PLUS 1, ROMBOX PLUS and BBC Master.
- Simply plugs into cartridge slot.

£10.00 FOR LIMITED PERIOD

TAPE TO DISK ROMs VERSION 2

- Transfer the majority of tape programs to disk.
- Acornsoft, Superior and Micropower no problem.
- Compatible with programs copied using Version 1.
- More successful than ever before.

T2P3 for the Acorn Plus 3
T2CU for the Cumana DFS
T2P4 for AP4 and E00 DFS
T2SD for the Solidisk DFS
T2SEDFS for the SEDFS

ONLY £24.95

* Upgrade 1-2 only £5 with original ROM

UPGRADES FOR DDOS & CHALLENGER OWNERS

Purchase the latest releases from the authors direct

Order DDOS 3.16 ONLY £7.95
DDOS 3.36 (please return original ROM)
DDOS 3.46
CHALLENGER 1.03

Also available - DDOS REVEALED

The most comprehensive guide yet to OPUS DOUBLE DENSITY. 120 pages covering ALL aspects of DDOS and CHALLENGER.

Release price - £7.95

JOYSTICK INTERFACE FOR ROMBOX PLUS or ACORN PLUS 1

- Uses cheap ATARI-type joysticks.
- Compatible with ALL Tape and Disk systems
- Emulation of keys by Expansion ROM 2.0
- Can be used with well written games either WITH OR WITHOUT A JOYSTICK OPTION.

"The ultimate Joystick Interface" . . . A&B July 87

"Well worth saving up for, I can recommend it to all Arcade addicts" . . . Electron User May 87

ONLY £14.95

- Requires Electron Expansion 2.0 . . . only £5 with this unit

JOYSTICKS

Switched Joysticks for the Slogger Joystick Interface.

Quickshot I £4.00
Quickshot II £6.00

ROM SOFTWARE

STARSTORE 2 £29.95
SEDFS upgrade ROM for CUMANA owners 24.95

BARGAIN CORNER

STARWORD	£34.50
STARSTORE	£9.95
STARMON	£9.95
STARGRAPH	£9.95
PRINTER ROM	£9.95
STAR TREK	£9.95
ELKMAN	£9.95
PDG	£9.95

OTHER PRODUCTS

5.25" 40/80 Track D/S disk drive inc. PSU	£149.00
3.5" 40/80 Track D/S disk drive inc. PSU	£140.00
Printer lead (for ROMBOX PLUS/PLUS 1)	£9.95
Electron Advanced User Guide	£3.95
Vine Micros ADDCOM	£28.00
Vine Micros MATRIX ROM	£36.00

All prices include VAT P&P UK Mainland only

Expiry Date	PLEASE SUPPLY	Cost
1		£
2		£
3		£
4		£
5		£
Total		£

Cheques payable to
SLOGGER LTD

Access No _____
 Visa _____
Name _____
Address _____

Please send orders to SLOGGER LTD, 107 RICHMOND ROAD, GUILDFORD, KENT

32K SIDEWAYS RAM CARTRIDGE

for ROMBOX PLUS or PLUS 1

- Ever popular on the BBC.
- Best used with EXP ROM 2.0
- (1) Save ROM backups for loading into Sideways RAM
- (2) Set up a 16K Print Buffer
- Splits as 2 x 16K pages.
- VIEW and VIEWSHEET in one slot!!!
- Write protect option . . . prevents corruption of software.

"A very powerful piece of hardware" . . . Electron User July 87

ONLY £34.50
(£39.50 with EXP ROM 2.0)

EXPANSION ROM 2.0

for the ROMBOX PLUS and PLUS 1

- Support Printer Buffer with 8K/16K sideways RAM or 12K with MASTER RAM BOARD.
- RSAVE command to save ROM images to Tape or Disk.
- RLOAD command to load Sideways RAM with a ROM image.
- ROMS command to displays ROM/RAM in system.
- JOYSTICK command for the SLOGGER Joystick Interface.
- Allows cassette loading in high resolution.
- Supports all standard functions (Printer, ADC, RS423).
- Simply fits into internal ROM socket.

"There is room for improvement in the operating system. No doubt this was the idea behind Expansion 2." Electron User, July 87.

ONLY £11.95

SLOGGER'S AUTHORISED DEALERS

ABERDEEN	LEICESTER
Micro Logic	DA Computers
0569 66233	0533 549407
BIRMINGHAM	LONDON
Allen James Computers	Computace
021 580 0181	01 580 0181
BRISTOL	LUTON
Avon Computer Exchange	Hobbyte
0272 637981	0582 457195
BROMLEY	MARKET-HARBOROUGH
Datastore	Harborough Computers
01 460 8991	0858 635280
BURNLEY	MERSEY SIDE
Atomic Computer Systems	Comshop
0282 54299	051 639 3041
BYFLEET	NEWBURY
Calancraft	M&S Associates
0932 342137	0635 45774
CARDIFF	OLDHAM
Computer Exchange	Home & Business
0222 83069	061 633 1608
CARDIFF	SHEERNESS
Cardigan Electronics	Swaletek Systems
0239 614483	0795 661 0000
CHESTER	STOCKPORT
Reeds Photo & Computing	Dream Electronics
0494 783373	061 429 0626
CROYDON	TELFORD
Computer Centre	A1 Computer Supplies
01 683 2546	0952 502737
FAREHAM	TROWBRIDGE
Project Expansions	West Wiltshire Micros
0329 221109	02214 62759
FARNHAM	ULVERSTON
Farnham Computers	Skand Computers
0252 723107	0229 56984
GLASGOW	WARRINGTON
Computer Depot	Cheshire
041 332 3944	0925 414109
NETHERLANDS	
Velobyte Computers	Rotterdam 010 413 8197

MAIL ORDER ONLY
MILTON KEYNES Towerhill 0980 74246
STOCKPORT 21st Software 0625 528885
NETHERLANDS Compumasters 31 10 436 18 00



SLOGGER

Tel: 0634 52303

SEND
FOR
THEM
TODAY

M & M COMPUTERS

Bon-Accord House

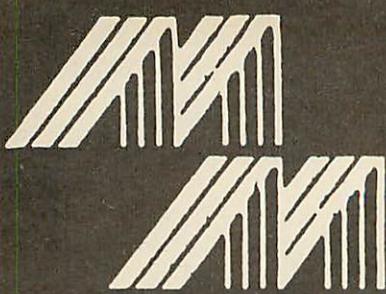
41 Albert Street, Aberdeen AB1 1XU

Tel: 0224-571735

Telex 739916

Incorporating **MICROBANK LTD**
031 331 1716

Acorn
The choice of experience



COMPACT SOFTWARE

GAMES/ADVENTURES		R.R.P.
BBC PUBLICATIONS		
White Knight	£14.95	
BLUE RIBBON		
Games Disc I	£12.95	
Games Disc II	£12.95	
CDS		
Birdie Barrage Golf	£12.95	
Steve Davis Snooker	£12.95	
MICRO POWER		
Dr Who and the Mines of Terror	£9.95	
Micro Power Magic	£9.95	
SQUIRREL		
Games Disc	£14.95	
SUPERIOR		
Revs/4 Tracks	£19.95	
Elite	£19.95	
Repton III	£14.95	
Galaforce	£14.95	
Karate Combat	£14.95	
Repton 2	£14.95	
Strykers Run	£14.95	
Speech	£14.95	
Citadel	£14.95	
Acornsoft Hits Volume I	£14.95	
Acornsoft Hits Volume II	£14.95	
Codename Droid	£14.95	
Around the world in 40 screens disc	£9.95	
TYNESOFT		
Big K.O.	£12.95	
Goal	£11.95	
Jet Set Willy II	£12.95	
Commonwealth Games	£11.95	
Mousetrap	£11.95	
US Drag Racing	£11.95	
Vindaloo	£11.95	
Winter Olympics	£11.95	
EDUCATIONAL		
A.S.K.	£22.95	
Best Four Maths	£22.95	
Best Four Language	£22.95	
BBC PUBLICATIONS		
Figures of Fun	£18.95	
HIGHLIGHT		
Comp I	£19.95	
Comp II	£19.95	
Superior Collection 1	£14.95	
Superior Collection 2	£19.95	
Grand Prix Construction Kit	£14.95	

ARCHIMEDES
SOFTWARE
NOW
AVAILABLE

BBC SOFTWARE

GAMES/ADVENTURES

Dr Who and the Mines of Terror Master B+	£9.95
Micro Power Magic 40 Track	£7.95
Micro Power Magic 80 Track	£7.95
Micro Power Magic	£7.95
Dr Who and the Mines of Terror (16K Rom + Cassette)	£8.95
Dr Who and the Mines of Terror (16K Rom + Disc)	£9.95
Castle Quest Disc	£7.95
Castle Quest Cassette	£6.95
Star Fleet Encounter	£9.95
ACORNSOFT	
4-Tracks	£9.95
Magic Mushrooms	£12.95
Boxer	£9.95
Bouncer	£9.95
Complete Cocktail Maker	£9.95
Snooker	£9.95
Terrapod	£9.95
Drogsna	£9.95
Aviator	£17.65
ACORNSOFT Disc	
Snooker	£11.50
Magic Mushrooms	£14.95
4-Tracks Disc	£12.65
Aviator	£17.65
ARCANA	
View Professional	£113.95
Master Overview	£98.90
Powerplay Disc	£14.95
AUDIOGENIC	
Thunder Struck BBC/Ele	£7.95
Thunder Struck Disc	£11.95
Power pack	£9.95
The Last of Free BBC/Ele	£7.95
Pycastria Disc	£11.95
Pycastria BBC/Electron	£7.95
International Megasports/Genesis Project	£8.95
Complete BBC	£19.95
BBC PUBLICATIONS	
White Knight MK12 Disc	£18.95
White Knight MK12	£9.95
Able to transfer to disc	£10.95
Maths with a Story I Disc	£9.95
Battlefields (Cassette)	£17.34
Picture Craft (Disc)	£12.95
Modem Master	£12.95
SUPERIOR	
Around the world in 40 screens disc	£7.95
Acornsoft Hits I	£9.95
Acornsoft Hits I Disc	£11.95
Acornsoft Hits II	£11.95
Acornsoft Hits II Disc	£11.95
Elite Disc	£14.95
Revs/4 Tracks	£12.95
Revs/4 Tracks	£14.95
Elite	£12.95
Ravenskull	£9.95
Ravenskull Disc	£11.95
Repton III	£9.95
Repton III Disc	£11.95
Strykers Run	£9.95
Strykers Run Disc	£11.95
Thrust Disc	£11.95
Thrust BBC/Electron	£7.95
Superior Collection Vol 1	£11.95
Superior Collection Vol 2	£11.95
Grand Prix Construction Kit	£11.95
Karate Combat Disc	£11.95
Karate Combat BBC/Electron	£8.95
Citadel	£9.95
Citadel Disc	£11.95
Repton II	£9.95
Repton II Disc	£11.95
Galaforce	£9.95
Galaforce Disc	£11.95
Codename Droid Disc	£11.95
Codename Droid Cass	£9.95
TYNESOFT	
Big K.O. BBC/Electron	£7.95
Big K.O. Disc	£12.95
Winter Olympics Disc	£12.95
Future Shock Disc	£12.95
Goal Disc	£12.95
Ian Botham Cricket Disc	£12.95
Commonwealth Games Disc	£12.95
Jet Set Willy II Disc	£12.95
Jet Set Willy II BBC/Ele	£7.95
Future Shock BBC/Ele	£7.95
Goal BBC/Ele	£7.95
Ian Botham Cricket BBC/Ele	£7.95
Jet Set Willy BBC/Elec	£7.95
Winter Olympics BBC/Elec	£6.95
U.S. GOLD	
Impossible Mission BBC/Ele	£9.95
Questprobe	£7.95
Impossible Mission Disc	£14.95
Impossible Mission	£9.95
Raid Over Moscow	£9.95

Rebel Planet	£9.95
Questprobe	£7.95
Bounty Bob	£9.95
Tapper	£9.95
ULTIMATE	
Cosmic Battlezones	£9.95
BEAU JOLLY	
Five Star Games 'B'	£9.95
Computer Hits III	£9.95
Computer Hits 2 Disc	£14.95
Computer Hits 2	£9.95
Computer Hits 10 games	£9.95
BUG-BYTE	
Plan B	£2.99
Dunjunz	£2.99
Skyhawk BBC/Ele	£2.99
Star Force Seven	£2.99
Roboto	£2.95
Twin Kingdom Valley	£2.95
Jack Attac	£2.95
Savage Pond	£2.95
CDS	
Brian Clough's Football Fortunes	£14.95
Brain Clough's Football Fortunes	£17.95
Colossus 4 Chess BBC/Ele	£9.95
Colossus 4 Chess Disc	£14.95

DESIGN PEOPLE SOFTWARE

Tanks Disc	£12.95
Sink the Bismarck Disc	£10.99
DOCTOR SOFT	
Double Pantomime Disc	£19.95
Phantom Combat Disc	£12.95
Phantom Combat	£9.95
DOMARK	
Young Players Full Edition	£19.95
Trivial Pursuit Disc	£19.95
Young Players Question Pack (Trivial Pursuit)	£7.95
Trivial Pursuit	£14.95
ELITE	
Commando	£9.95
Air Wolf	£9.95
Air Wolf Disc	£14.95
FIREBIRD	
The Sentinel	£9.95
The Sentinel Disc	£14.95
GREMLIN	
Footballer of the Year	£9.95
Footballer of the Year Disc	£14.95
IMAGINE	
Yie Ar Kung Fu	£8.95
Yie Ar Kung Fu Disc	£12.95
LEISURE GENIUS	
Monopoly Disc	£14.95
Scrabble	£12.95
Scrabble Disc	£14.95
MACSEN	
Blockbusters BBC/Ele	£7.95
MARTECH	
W.A.R.	£8.95
W.A.R. Disc	£14.95
Samantha Fox Disc	£12.95
MELBOURNE HOUSE	
The Hobbit	£9.95
Lord of the Rings	£15.95
Way of the Exploding Fist	£9.95
Way of the Exploding Fist Disc	£14.95
MIRRORSOFT	
Strike Force Harrier	£9.95
Strike Force Harrier Disc	£12.95
Hi-Bouncer	£6.95
MOSAIC/LEVEL 9	
The Secret Diary of Adrian Mole Disc	£12.95
OCEAN	
Daley Thompson Supertest D	£14.95
Yie Ar Kung Fu II	£8.95
BUSINESS SOFTWARE (MASTER)	
Guest Sense (Guest House & Hotel package)	£172.50
Fix Sense (Fixed Asset package)	£172.50
Per Sense (Personnel package)	£172.50
Also available for IBM, Amstrad & Apricot equipment.	

H S SOFTWARE

READ-RIGHT AWAY	
Reading Pack 1. Age 5-8 years	
For the BBC Model B Disc	£11.95
ADVENTUROUS ENGLISH	
English Grammar & Language Skills	
Age 7-11 years Disc	£7.95
CROSSWORDS	
Range 8 years to adults	
For the BBC/Electron Disc	
ENTERTAINING ENGLISH	
English Language Skills	
Age 7-11 years for the BBC B' Disc	£11.95

To: M & M COMPUTERS, Bon-Accord House, 41 Albert Street Aberdeen AB1 1XU
Please send me

I enclose a cheque for £..... payable to **M & M COMPUTERS**.
 Please debit my Access/Visa Account
 No. _____
 Name. _____

Signed
Address



WE ALSO STOCK ALL ACORN HARDWARE

POSTAGE & PACKING ON SOFTWARE

All prices include VAT at 15%

For Software add £1 for outside Scotland,
and 50p within Scotland, for orders over
6 games post & packing is FREE.

E.O.+E.

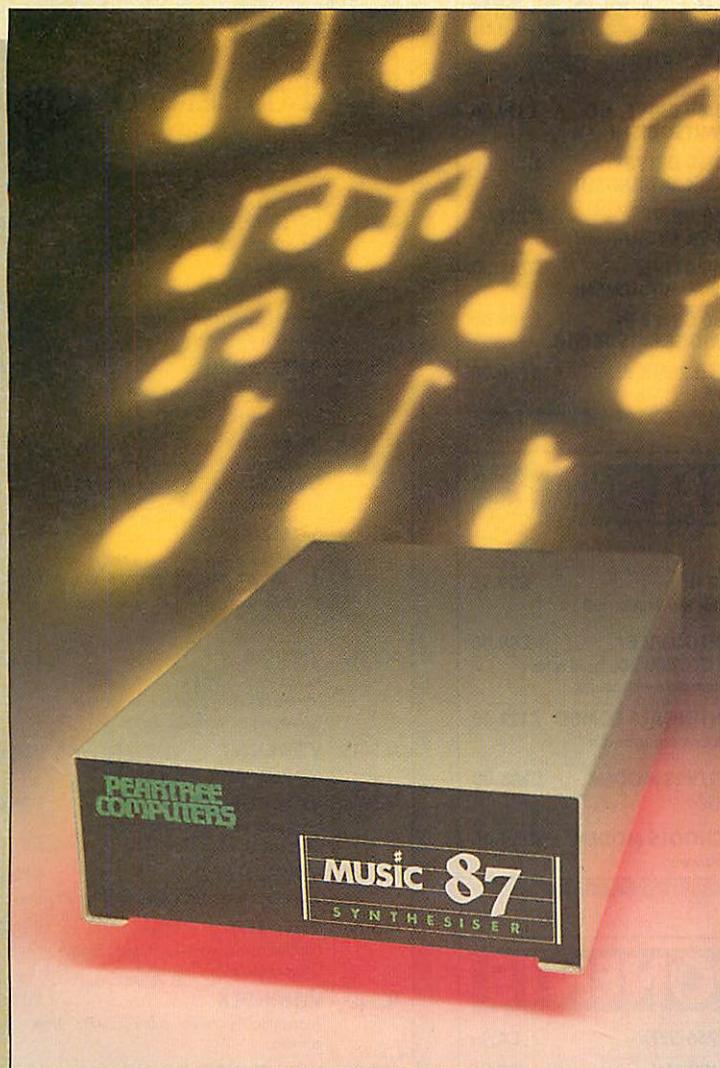
Mail Order

Acorn
The choice of experience.

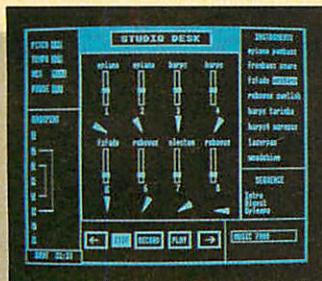
**PEARTREE
COMPUTERS**
LTD

**Approved
Acorn dealer**

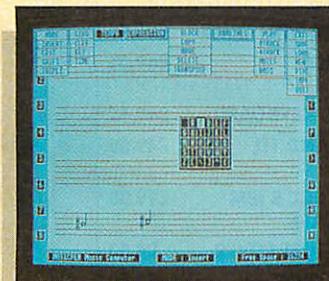
Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595



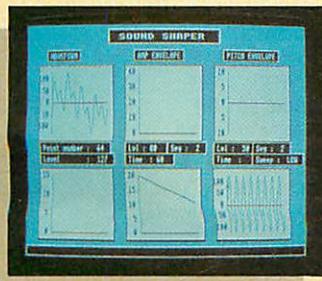
► PEP024



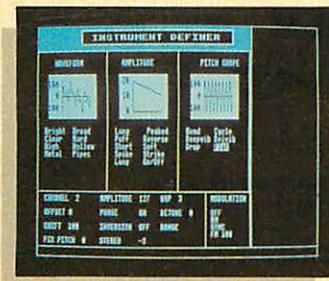
Studio Desk menu with mouse driven record, play, rewind options



Music Editor menu, light pen & mouse driven with complete menu options at top



Sound Shaper allowing you to create your own waveforms, envelopes, mouse, lightpen or keyboard driven



Instrument definer allows you to define your own instrument pitch, amplitude and wave forms

You ain't seen (or heard) nothing yet!

Dear Reader

To make sure that there can be no confusion between Peartree Products and products by other manufacturers we have renamed the Peartree MUSIC 7000 the Peartree MUSIC 87 synthesiser.

The Peartree MUSIC 87 is a high quality music add on for the BBC B, B+ or Master 128. It enables the production of eight voice musical compositions, and incorporating an unlimited range of instrumental sounds designed entirely by you, the user.

The MUSIC 87 solves all the old problems and adds these new outstanding features:

- **6502 2nd processor compatible**
- **Light pen driven**
- **Mouse driven**
- **High resolution (mode 0) screen graphics in most of the program to show maximum detail and minimum clutter**
- **Menu driven**
- **Facility to print out music score in standard music notation**
- **Creation of sounds using wave forms and sound parameters defined entirely by the user**
- **Music score displayed on screen in time with play back**
- **Functions include DFS and ADFS**
- **Music keyboard available soon**
- **Software available to upgrade your Music 500 or Music 5000 at £39.95 (PEP025)**

MUSIC 87
SYNTHESISER

Hardware & Software
complete at only
£79.95

PLEASE USE OUR CODES WHEN ORDERING



PEARTREE COMPUTERS

Approved service centre for all Acorn products.

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595

HARDWARE

ACH001	BBC MASTER 128	£385.00
	128K complete with View, Viewsheet, basic editor. ADFS 1770 DFS.	
***special offer includes FREE MUSIC 500		<i>NEW PRICE</i>
ACH002	BBC MASTER COMPACT	£375.00
	128K computer 640K disc drive built in RGB comp video, joystick and printer port	
ACH003	BBC MASTER COMPACT TV	£395.00
	As above with PAL TV modulator	
ACH004	BBC MASTER COMPACT MONO	£445.00
	As above with high resolution green monitor	
ACH005	BBC MASTER COMPACT COLOUR	£545.00
	As above with RGB medium res colour monitor with video composite	
ACH011	TURBO UPGRADE for MASTER 128	£99.00
	65C102 co-processor 4MHz 64K ram extra high Basic, high editor	
ACH012	512K MSDOS for MASTER	£189.00
	IBM compatible DOS plus 8186 processor	
ACH041	UNIVERSAL 2nd PROCESSOR	£75.00
	Allows both the turbo upgrade and the 512K upgrade to be run on the BBC Model B or B+	
ACH015	1770 DFS KIT for BBC B	£41.00
	Allows BBC to access disc drives Allows you to use ADFS as well	
ACH016	ADFS ROM for 1770 or BBC B+	£24.00
	Gives 720K per disc	
ACH020	32016 CO-PROCESSOR	£999.00
	32 bit processor Complete with Fortran, Pascal, Cambridge Lisp, C Basic and 32016 assembler	
ACH021	ACORN CAMBRIDGE WORK STATION	£3400.00
	4MB work station with 32016 co-processor	
ACP003	MEGAMOUSE	£49.00
	High quality UK manufactured Slip free rubber coated ball Fully AMX compatible	
ACH034	ACORN MUSIC 500	£39.00

ECONET

ACH006	ECONET BBC MASTER ET 128	£300.00
	No DFS Econet station with 128K memory	
ACH007	ECONET KIT	£55.00
	Upgrades for BBC B or BBC B+	
ACH008	ECONET STARTER KIT	£79.00
ACH009	ECONET SOCKET KIT	£29.00
ACH010	ECONET MODULE	£43.00
	Upgrade cartridge for Master 128	
ACH022	ECONET 10 STATION LEAD SET	£25.00
ACP006	PRINTER SERVER EPROM	£39.00
	Allows BBC machine to be a printer server station	
ACH031	WINCHESTER 30MB (ACORN) with LEVEL 3 FILE SERVER	£1449.00
ACH039	FILESTORE E01	£819.00
	Stand alone twin floppy file server unit Contains clock box, terminator, etc.	
ACH040	FILESTORE E20	£709.00
	20MB hard disk for use with Filestore E01	

DISC DRIVES

ACH026	SINGLE 40/80 DRIVE, NO PSU 400K MITSUBISHI	£119.00
ACH027	SINGLE 40/80 DRIVE inc. PSU 400K MITSUBISHI	£135.00
ACH028	DUAL 40/80 DRIVE, NO PSU 800K MITSUBISHI	£229.00
ACH029	DUAL 40/80 DRIVE, inc. PSU 800K MITSUBISHI	£269.00
ACH030	DUAL 40/80 DRIVE IN MASTER BRIDGE MITSUBISHI	£289.00
ACH032	WINCHESTER 20MB & 400K DRIVE	£766.00

MODEMS

ACS075	COMMSTAR II	£29.95
	Now compatible with Master 128	
ACP014	PACE NIGHTINGALE	£99.00
	1200/75 75/1200 300/300 baud rates BT approved complete with cables	
ACP015	PACE NIGHTINGALE COMBO	£129.00
	As above with Comstar software	
ACP020	WS3000V21/V23 MODEM	£285.00
	Hayes compatible	
ACP021	WS4000 SCHOOLS MODEM	£159.00
	Autodial, autoanswer	

COMPONENTS

ACP007	EPROM 27256 32K	£4.95
ACP008	EPROM 27128 16K	£3.95
ACP010	8K RAM CHIP	£3.50
	Low power ram chips used in sideways rams	
ACP012	EPROM ERASER WITH TIMER	£29.95
ACP013	EPROM BLOWER	£69.00
	Will program 2764, 27128, 27256 and 27513	
ACP023	ACORN BBC B KEYBOARD	£49.00
ACP027	ACORN 8271 AND TTL	£49.00
	Complete DFS kit	
ACP028	BBC B+ AND BBC B IBM LOOKALIKE CASE	£99.00
ACP033	BBC MASTER DUST COVER	£4.50
ACP034	BBC B DUST COVER	£4.50

The Acorn *Music 500*
SYNTHESISER

Now available from Peartree the Acorn Music 500 for the BBC, BBCB+, Master 128
£39.00 excluding VAT.
only from PEARTREE

► ACH034

SOFTWARE



Computer Concepts

ACS002	WORDWISE PLUS	£45.00
	Mode 7 editing, preview in mode 0 Multi document editing	
ACS003	INTER SHEET	£42.00
	40, 80 and 105 column mode multiple spreadsheet	
ACS004	INTER CHART	£30.00
	Built in Epson screen dump Supports pie, line and bar charts	
ACS005	INTER WORD	£42.00
	80 or 105 column word processor Continuous documents	
ACS006	INTER BASE	£50.00
	Compatible with all filing systems Card index mode, contains powerful Basic like programming language	
ACS033	SPELLMASTER	£50.95



ACORNSOFT

ACS012	VIEW 3.0	£53.00
	Industry's standard word processor For the BBC B, B+, 6502 compatible Including printer driver generator	
ACS013	VIEWSHEET	£36.00
	Acornsoft standard spreadsheet	
ACS014	VIEWSTORE	£37.00
	Complete with report generator Data can be imported from other view products	
ACS015	VIEWSPELL	£32.00
	Spelling checker for View with 70,000 words	
ACS016	VIEWPLOT	£24.00
	Enables you to draw lines, pie graphs Compatible with Viewsheet	
ACS017	VIEWINDEX	£13.00
	Automatically creates indexes, notes, page numbers	
ACS018	VIEW PRINTER DRIVER GENERATOR	£9.00
	To be used to personalise View documents with special features	
ACS181	OVERVIEW	£86.00
	For the MASTER series only Includes Viewplot, Viewstore, Viewspell, Viewindex and the View Printer Driver Generator	
ACS20	ISO PASCAL	£52.00
	Full implementation of the ISO standard	
ACS053	ISO PASCAL S.A.G. DISC	£29.00
	Generate stand alone code	
ACS021	LOGO	£52.00
	Good introduction for children with total graphics support	
ACS022	TERMULATOR	£29.00
	Terminal emulator enables the host computer to be sent directly to the BBC's output driver	
ACS023	COMAL	£39.00
	Programming language standard in many European countries	
ACS024	BASIC EDITOR	£25.00
	Powerful screen basic editor	
ACS025	MICRO PROLOG	£60.00
ACS026	BCPL ROM	£49.00
ACS027	BCPL CALCULATION	£29.00
ACS028	BCPL STAND ALONE GENERATOR	£39.00

Acorn
The choice of experience.

PEARTREE COMPUTERS

M
BRITISH
BROADCASTING
CORPORATION
MASTER SERIES
MICROCOMPUTER
LTD

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595

SOFTWARE

ACS054	FORTH ROM	£39.00
ACS055	FORTH DISC	£14.95
ACS056	MASTER LISP C-ROM	£49.00
ACS058	MASTER LOGO C-ROM	£52.00
ACS059	6502 DEVELOPMENT PACK DISC	£39.00
ACS060	GXR for MODEL B	£23.00
ACS061	GXR for MODEL B+	£23.00
ACS031	DOS COPY BBC/MS-DOS	£14.95
	BBC MSDOS copies to or from many IBM MSDOS disc formats Requires 1770 based DFS	
ACS032	CPMBEEB BBC/CPM	£14.95
ACS038	AMX MOUSE AND SUPERART	£65.00
ACS039	AMX DESK	£19.00
ACS040	AMX UTILITIES	£11.50
ACS041	AMX SUPERART	£43.00
ACS042	AMX PAGEMAKER	£43.00
ACS043	AMX 3D ZICON	£21.00
ACS044	AMX DATABASE	£21.00
ACS045	AMX XAM	£21.00
ACS046	AMX MAX	£17.00
ACS047	THE ARTIST SOFTWARE	£39.00
ACS048	ARTIST AND MEGAMOUSE	£79.00
ACS050	ADVANCED DISC INVESTIGATOR	£22.50
	Powerful disc utility Back up most protected discs Check and repair faulty tracks Compatible with the BBC B, B+ and the Master	
AC051	ADVANCED DISC TOOLKIT	£27.50
	Compatible with all Acorn products 35 extra commands ADFS formatter and back up plus many more powerful utilities	
ACS052	MUSIC 500 SOFTWARE	£9.95
	Ample software with full manual	
ACS075	ADVANCED 1770 DFS	£27.50
	Turn our RAM cartridges into RAM disc 62 file catalogue 640K disc capacity	

MONITORS

COLOUR

MON001	HANTAREX COLOUR MONITOR MEDIUM	£239.00
	Medium to high resolution RGB interface Composite video and sound input	
MON002	MICROVITEC 1451 COLOUR MON MED	£249.00
	Medium res monitor Metal or plastic case, please state when ordering RGB interface	
MON003	MICROVITEC 1451 A/P COL MON MED	£279.00
	As above with audio and composite video input	
MON004	MICROVITEC 1441 MON COL HIGH	£449.00
	Very high resolution monitor 895 pixels RGB interface	
MON005	TAXAN SUPER VISION 625 COL HIGH	£349.00
	12" super high resolution colour monitor 4 unique text modes Front monochrome text switch 640 x 262 line resolution	
MON006	PHILIPS CM8833 COLOUR MONITOR	£273.86
	14 inch medium resolution monitor RGBI RGB TTL	
MON007	PHILIPS CM8852 COLOUR MONITOR	£299.00
	14 inch medium/high resolution RGBI RGB	

MONOCHROME

MON008	HANTAREX GREEN MONITOR	£65.00
	The high resolution green monitor supplied to many education departments and hospitals	
MON009	KAGA KX 117 GREEN MONITOR	£89.00
	P31	
MON10	KAGA KX 118 GREEN MONITOR	£99.00
	Clarity exceptional on BBC text	
MON11	KAGA KX 119 AMBER MONITOR (PUL)	£99.00

MON12	PHILIPS GREEN MONITOR	£69.00
	Many other monitors are in stock. We can supply, please call for prices and deliveries.	

LEADS

LDS001	BBC TO TV LEAD	£1.25
LDS002	BBC TO GREEN MONITOR LEAD	£2.95
LDS003	BBC TO SONY/KAGA COLOUR MONITOR	£5.95
LDS004	BBC TO MICROVITEC LEAD	£2.20
LDS005	PHONO TO PHONO LEAD	£1.25
LDS006	BNC TO BNC	£2.95
LDS007	BBC TO CASSETTE	£2.25
LDS008	BBC TO ACORN CASSETTE LEAD	£2.25
LDS009	BBC TO CENTRONICS	£9.95
LDS010	BBC TO SERIAL PRINTER	£9.95
LDS011	4 WAY MAINS TRAILING SOCKET	£9.50
LDS012	CABLE FOR MODEM	£4.95
LDS014	MASTER COMPACT PRINTER LEAD	£15.95

BOOKS

MIS012	BBC MASTER REFERENCE GUIDE PT1	£14.95
MIS013	BBC MASTER REFERENCE GUIDE PT2	£14.95
MIS014	VIEW MANUAL (BBC)	£10.00
MIS015	VIEWSHEET MANUAL	£10.00
MIS019	VIEWSTORE MANUAL	£10.00
MIS016	DFS OPERATING SYSTEM MANUAL	£6.95
MIS017	BBC USER GUIDE	£14.95
MIS024	BBC ADVANCED USER GUIDE	£16.95
MIS018	ADVANCED SIDEWAYS RAM USER GUIDE	£9.95

PRINTERS

PRT001	EPSON LX86 PRINTER	£199.00
	120CPS NLQ mode Centronics Interface	
PRT002	EPSON FX800	£399.00
	9 pin dot matrix 180 CPS draft mode, 35 CPS NLQ mode 8K buffer Parallel interface standard 80 column	
PRT003	EPSON FX1000	£499.00
	9 pin dot matrix 200 CPS draft mode, 35 CPS NLQ mode 8K buffer Parallel interface standard 136 column	
PRT004	EPSON LQ800 PRINTER	£499.00
	24 pin dot matrix 180 CPS draft mode, 60 CPS NLQ mode 7K buffer Parallel interface standard 80 column	
PRT005	EPSON LQ1000 PRINTER	£699.00
	24 pin dot matrix 180 CPS draft mode, 60 CPS NLQ mode 7K buffer Parallel interface standard 136 column	
PRT008	MP 165 PRINTER	£199.00
	165 CPS draft mode, 40 CPS NLQ mode 2K buffer Centronics interface Built in tractor feed Epson compatible	
PRT11	JUKI 6100 PRINTER	£299.00
	18 CPS daisy wheel printer Standard ribbons Centronics interface	
PRT21	PANASONIC KX-P1081 DOT MATRIX PRINTER	£147.00
	Fast draft printing at 120 CPS Excellent Near Letter Quality font at 24 CPS	
PRT14	EPSON LX TRACTOR FEED	£22.00
PRT16	EPSON LX CUT SHEET FEEDER	£59.95
PRT23	EPSON LQ1000 TRACTOR FEED	£50.00
PRT24	EPSON LQ1000 CUT SHEET FEEDER	£130.00
PRT25	EPSON FX80+ CUT SHEET FEEDER	£129.95

**Please Note
We have many other makes of printers in stock such as

brother

Always call for availability.

PRINTER RIBBONS

MIS005	RIBBON FOR MX FX80 & JUKI 5510	£4.50
MIS006	RIBBON FOR LX80 LX86	£4.50
MIS007	RIBBON FOR MP165	£5.00
MIS008	RIBBON KAGA KP810/ CANON PW1	£5.95
MIS009	RIBBON FOR EPSON FX RX/100	£7.95
MIS034	RIBBON FOR EPSON LQ800	£11.95
MIS023	RIBBON FOR CPA80	£3.50

Acorn
The choice of experience.

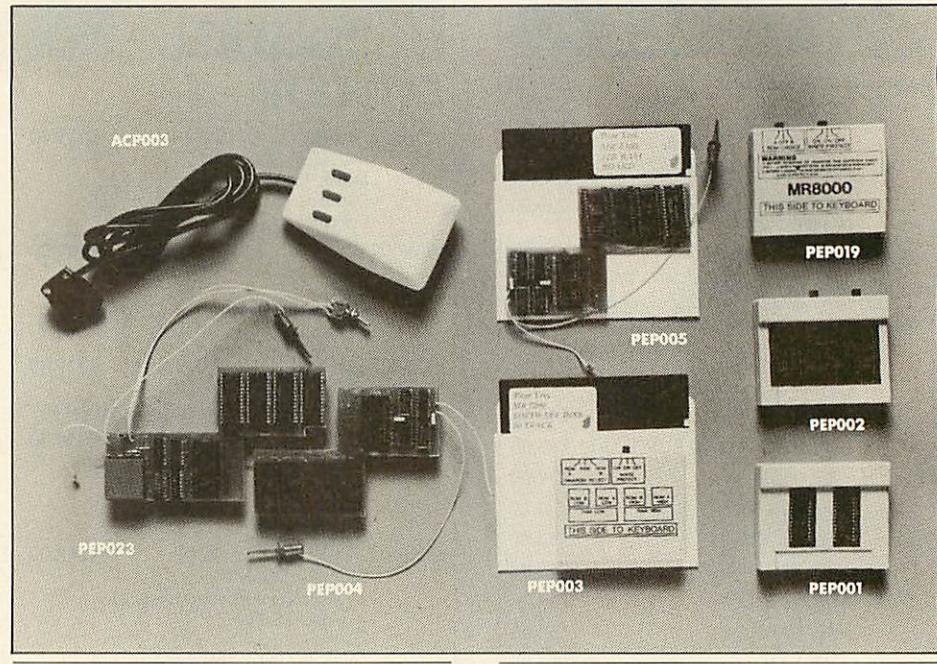
PEARTREE COMPUTERS

**BRITISH
BROADCASTING
CORPORATION
MASTER SERIES
MICROCOMPUTER**

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF

PEARTREE PRODUCTS

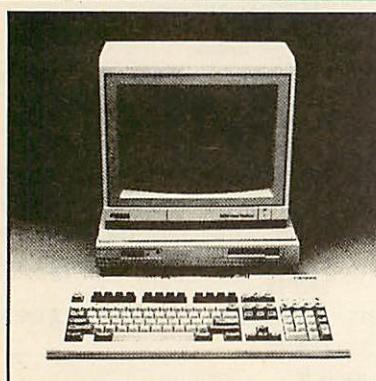
PEP001	PEAR 1 ROM CARTRIDGE	£8.95
	Add 32K rom to your Master	
PEP002	MR6000 MASTER CARTRIDGE	£11.95
	Add 64K rom to your Master	
PEP003	MR7200 MASTER RAM CARTRIDGE	£29.95
	Add 32K ram to your Master	
PEP019	MR8000 MASTER RAM CARTRIDGE	£39.95
	Add 64K ram to your Master	
	Battery backed up	
	Battery life five years	
PEP023	MR4800 RAM BOARD	£59.95
	RAM board for the BBC Model B	
	128K RAM	
	Battery backed up	
	Small, easy to fit, complete with utility software	
	Includes write protect switch, battery included	
PEP004	MR3000 ROM BOARD	£15.95
	Still going strong. This has proved to be a very	
	popular mini rom board for the BBC Model B	
	Add 4 extra rom sockets	
PEP005	MR4200 RAM BOARD	£29.95
	Add 32K of sideways ram and 3 extra rom	
	sockets. Includes write protect switch	



PEP010	DISCS DS/DD 5.25 96 TPI	£13.50
	Life time guarantee	
	Reinforced hub	

PEP011	DISCS DS/DD 3.5	£26.00
	Double sided	
	Suitable for the Master Compact	

Archimedes



The ARCHIMEDES High Performance Computer Systems represent a considerable lead in performance, but how has this performance been put to use in the range of products? The ARCHIMEDES range includes the 300 Series and the more sophisticated 400 Series.

All machines have features in common:

- **32 bit RISC technology;**
- **ergonomically styled in a 3 box presentation;**
- **'IBM enhanced' style keyboard with 3 button mouse;**
- **British Broadcasting Corporation Micro style operating system (ARTHUR);**
- **BB BASIC V;**
- **interfaces; printer, serial, monitor, stereo sound;**
- **ECONET plug-in option;**
- **a variety of podules can be fitted.**

THE 300 SERIES

The 300 Series, identified by its red function keys,

The NEW High Performance 32 Bit Risc Processor from Acorn

consists of two models, ARCHIMEDES 305 with 0.5 Mbyte of RAM and ARCHIMEDES 310 with 1 Mbyte of RAM. These machines are the latest generation of British Broadcasting Corporation Micros. They offer, at low cost, all the basic features with expansion capabilities. Both machines have a 512 Kbyte ROM and a 1 Mbyte (unformatted) 3½" disc drive.

THE 400 SERIES

The more powerful 400 Series offers considerably increased expansion capabilities. These machines are the new range of Acorn Computers.

The ARCHIMEDES 410 has 1 Mbyte of RAM; 1 Mbyte (unformatted) 3½" disc drive; a hardware floating point unit option; a co-processor bus; a hard disc controller; a four socket back plane; 512 Kbytes of ROM.

At the top of the range is ARCHIMEDES 440. This machine possesses all the features of the 410 as standard, with the adoption of 4 Mbytes of RAM and a 20 Mbyte hard disc.

ARCHIMEDES is an open system and its flexibility is achieved by fitting any of the following podules (peripheral modules) via a back plane:

- **hard disc controller (300 Series only);**
- **ROM extension board;**
- **MIDI music interface;**
- **MS-DOS co-processor;**
- **SCSI;**
- **hardware floating point unit;**
- **Ethernet podule.**

Third party suppliers will be meeting other user requirements.

300 SERIES

A305 SYSTEM	BASIC	£799
	MONO	£849
	COLOUR	£999
A310 SYSTEM	BASIC	£875
	MONO	£925
	COLOUR	£1075

400 SERIES

A410 SYSTEM	BASIC	£1399
	MONO	£1449
	COLOUR	£1599
A440 SYSTEM	BASIC	£2299
	MONO	£2349
	COLOUR	£2499

We accept Barclaycard/Visa/Access/Mastercard/postal orders or cheques. We accept government and educational orders. Leasing available, please apply for written details.

You may purchase any of the items listed, by cheque made payable to
PEARTREE COMPUTERS LTD.

All you have to do is to list your requirements on a sheet of paper, post it to us quoting ref, and we will despatch your goods within 24 hours, whenever possible.

Please add the following amounts for postage and packing:

Items below £10.00	add £1.50
Items below £50.00	add £2.50
Items below £100.00	add £3.50
Items over £100.00	add £10.00

Independent courier for items over £100.00

All prices exclude VAT.

Access/Barclaycard holders—call us on our new special line: (0480) 50595

Prices are correct at time of going to press.
Peartree Computers reserves the right to change prices without prior notice.

Build your own system...

with the Minerva SYSTEMS DELTA, GAMMA and SIGMA

Individual programs designed to integrate; use separately or link together to form a powerful business system. Systems Delta, Gamma and Sigma... designed by highly acclaimed professional programmers with proven ability on the BBC, now providing definitive software for the Archimedes.

ARCHIMEDES

DeltaBase £29.95
Extremely powerful yet simple to use general Database. Over 8000 records, 255 fields and 16 subsets. Pull down Help Screens. Various screen modes. Extensive single or multiple criteria searches, sorts and maths facilities. Restructuring records is easy. Imports data from Viewstore, Betabase, InterBase, Mini-Office, etc.

System DeltaPlus £69.95
Extensive Relational Database Management System. 2 billion records. 16 million fields. 24 million subsets. Infinite files open at once. Powerful WIMP database. Multiple user-definable print formats. Unrivalled, comprehensive maths, searches and sort. Mailing labels. Extensive Reporter. Card copier. Fully programmable.

GammaPlot £34.95
Versatile Graphics program. Multiple charts on screen at any time including pie, scatter, line, hist, 3D. On-Screen editor for text presentation. Macros. Entry by keyboard or any Delta/Gamma File.

System GammaPlus £69.95
Graphics Management System. Multiple charts on screen at any time. Over 10 types available. Definable scaling and screen formats. Screen editor. Statistical analysis. Three dimensional charting. Macros. Fully programmable.

BBC

System Delta with Card Index £64.95
Still the most comprehensive and flexible data management system on the BBC. 8160 records, 255 fields, 8000 characters per record. 8 subjects. Up to 5 files open at any time. Find any record in 3 seconds. Extensive single or multiple criteria searches, sorts and maths facilities. Multiple print formats. Default card. Card copier for transfer between files. Fully programmable relational system with over 150 commands available.

Mailshot, Reporter and InterView Link £19.95 each
Three versatile support programs for use with all System Delta files. Mailshot produces up to 4 across labels and links with wordprocessors for mail-merged documents. Reporter produces simple lists as well as fully definable reports including negative or positive columns, averages, totals, headings, sub and sub-sub-totals. InterView Link transfers data directly or as a result of any calculation including sum, average, count, etc.

System Delta Personal Accountant £45.95 (Nominal £55.95)
Five comprehensive accounting modules for use separately or as integrated suite. Many advanced features as listed above. Total flexibility allows customisation if required.

Order Processing/Invoicing, Sales Ledger, Stock Management, Purchase Ledger, Nominal Ledger

School Administrator £69.95
Pupil and staff records allow extra fields to be added if desired. Entry reports for examination boards. Form 7 DES statistics, etc.

ARCHIMEDES

System Sigma t.b.a.
Powerful Spreadsheet Management System containing the facility to design your own tailored system. To be released late 1987.

System Delta Personal Accountant £69.95 each module

The only flexible accounting suite. Use modules separately or integrate. Contains many features not found on other micros including definable invoice layouts, varied discount structures on one invoice, archive mail order customers for future malshots, add new credit account at time of invoicing, selection of aged debtors/creditors or statements by various criteria, generates purchase orders, suggests stock levels, and sales graphs, numerous user-definable statements, nominal accounts, output with unlimited bank accounts, output to a spreadsheet.

Order Processing/Invoicing, Sales Ledger, Stock Management, Purchase Ledger, Nominal Ledger.

Specialist Applications

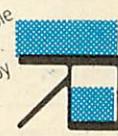
Flexible specialist software available for School Administrator, Video Rental, Newsagent, Hotelier, Genealogy. (Timetabling coming early 1988)

Minotaur Game £14.95
Full feature 3 dimensional animated maze type game. Unbelievable graphics. Use brains or force to kill the Minotaur

MICRO

Specialist Applications from £54.95
Comprehensive management programs for Hotelier, Video Rental and Newsagent.

System Gamma £49.95
The first Graphics Management System. Anyone can produce stunning graphics and charts easily from the menu driven GammaPlot supplied. Multiple charts on screen at any one time and in any position desired. On screen text editorial. Several fonts provided for variable text. Statistical analysis Macro facility. Entry by keyboard or System Delta files. Fully programmable to create your own graphics.



COMPUTER SOFTWARE AND SYSTEMS SPECIALISTS

69 SIDWELL STREET · EXETER EX4 6PH · TELEPHONE EXETER 0392 37756



Computaccount (UK) Ltd
21 Spring Hill
Birmingham B18 7BH
Tel 021 236 3455

We are major supplier to the educational
and health sectors

Please send an SAE for our free extensive catalogue and price list. Hundreds of products listed at excellent prices.

Archimedes

HIGH PERFORMANCE COMPUTER SYSTEM

Call for details on
300 series and
400 series systems

ACORN

NEW MASTER COMPACT series. Standard system is 128K, single 3.5 inch drive, bundled software.
Compact entry system £349.00
Compact TV system £359.00
Compact with mono monitor £389.00
Compact with colour monitor £529.00
RS 232 interface for compact £26.00
Extra 3.5in drive for compact £99.00
PAL TV adaptor for compact £26.00
Master 128 £379.00
Master ET £309.00
Master econet module £43.47
Turbo upgrade £108.00
64K upgrade kit £34.74
Master 512K upgrade £199.00
10 Mbyte Hard disc with fileserver £1086.95
30 Mbyte Hard disc with fileserver £1608.95
Eeprom cartridges £11.95
Acorn DNFS kit £95.00
ADFS ROM £26.04
ATPL Sideways RAM/ROM board £39.00
CONCEPT Keyboard £124.95
View manual £10.00
Viewsheet manual £10.00

ACCESSORIES

LISTING PAPER
All standard sizes available at very competitive prices. Single and multi-part.
LABELS
Various size, 1-across, 2-across, 3-across
RIBBONS
for most common printers, Epsom, citizen, Star, Amstrad, Juki, Canon etc.
CLEANING KITS
For UDU, disc drives and keyboards

DISCS

Full range of 3", 3.5" and 5.25" discs available at very competitive prices.

AMX

Please state whether for BBC or Master
AMX mouse with Super Art ROM £78.00
Pagemaker £43.43
Paintpot £13.00
Desk £21.70
Super Art ROM £43.43
Database £21.70
3D Zicon £21.70
Utilities £13.00

ROM SOFTWARE

Acorn:
View 2.1 £45.00
View 3.0 £63.00
ViewPlot (Disc) £25.75
ViewSpell £33.50
Viewsheet £45.00
Viewstore £45.00
GXR (please state whether for B or B+) £23.00
ISO Pascal £52.00
LISP £39.00
BCPL £46.00
Logo £52.00
ADFS £26.04
Computer Concepts:
Wordwise Plus £40.00
Printmaster £25.00
Accelerator £48.00
Speech ROM £27.50
Communicator £51.30
Interword £48.00
Intersheet £48.00
Interchart £28.50
Interbase £59.00
Spellmaster £46.00
Beebugsoft:
Toolkit Plus £33.00
Wordease £25.00
ICON master £29.00
ROMIT £29.00
Help II ROM £27.00
Sleuth ROM £27.00
Emon II £28.00
Spellcheck III £32.00
MUROM £24.00
Pace:
Commstar £29.57

COMPACT SOFTWARE

Revs 5 £16.95
Hits 1/Hits 2 £12.95
Pascal £59.00
Citadel £12.95
Repton 2 £12.95
Karate Combat £12.95
Strykers Run/Enhanced Strykers £12.95
CrataForce £12.95

FLEA MARKET

All items subject to availability
EPROM programmer £40.00
Programming software (ROM) £5.00
EPROM eraser £24.00
1200/75 Modem + Comm software £35.00
Torch Light Pen £25.00
Planner calc. Torch CPN format £35.00
Masterplanner. Torch CPN format £85.00
IBM user manuals (Installation/Basic) £15.00

MONITORS

Mono:
Sanyo DM4112 £79.95
Philips green Hi-res 7502 £76.00
Philips amber Hi-res 7522 £82.61
Zenith green Hi-res 1230 £85.00
Zenith amber Hi-res 1220 £85.00
Colour:
Microvitec std-res 1431 £191.00
Microvitec med-res 1451 £229.00
Microvitec hi-res 1441 £399.00
Philips 8533 RGB Med-res + composite video £251.00
Monitor cables (state types required) £3.50
Monitor bridge single height £18.90
double height £25.00

HOW TO ORDER

NAME		
ADDRESS		
Quantity	Item	Price
..... £..... £.....
..... £..... £.....
..... £..... £.....
Please add VAT at 15% to Total, including Carriage.		
Send to Computaccount (UK) Ltd., 21 Spring Hill, Birmingham B18 7BH or telephone 021 236 3455		TOTAL £.....

NAME

ADDRESS

Quantity

PRINTER ACCESSORIES

Epson FX 80/85 Tractor Unit £32.00
Epson FX 80/85 Sheet Feeder £125.00
Epson FX100/105 Sheet Feeder £139.00
Brother HR sheet feeder £209.00
Epson MX/RX/FX 80 Ribbons £3.75
Epson MX/RX/FX 100 Ribbons £4.50
Canon PW1080/1156 Ribbons £5.00
Taxan Kaga KP810 Ribbons £5.00
Citizen printer ribbons £3.99
All Epson Spares available £POA
Massive range of other compatible ribbons available

AMSTRAD

NEW PC 1512: Prices start at £449 for basic single drive + mono monitor system.
PCW 8256 £399.00
PCW 8512 £499.00
2nd disc drive for PCW8256 £155.00
Serial interface for PCW £59.00
Modem with Chit Chat software £169.00
Wordstar deluxe £60.00
Supercalc £43.00
Sagesoft Popular Accounts Plus £130.00
Dbase II £103.00
3 inch discs for PCW's £3.50

DISC DRIVES

Opus 5802 400k DS 40/80 track £109.00
Opus 5802DB dual 400k DS 40/80 track £205.00
Opus 5802D dual 400k DS 40/80 with PSU £233.91
Opus DDOS kit £52.12
Pace PSD1P 100k 40T with PSU £125.00
Pace PSD3P 400k 40/80T with PSU £144.00
Pace PDD3P dual 400k 40/80T with PSU £260.00
Akther MD802E dual 400k DS 40/80T mounted in monitor stand £285.00
Cumana CSX100 100k SS 40T £99.00
Cumana CS100 100k SS 40T with PSU £129.00
Cumana CS400S 400k DS 40/80T with PSU £152.00
Cumana CD800S dual 400k SS 40T with PSU £295.00
Cuman CS354 SS 3.5" with PSU £121.70
Cuman CD358 DS 3.5" with PSU £210.00
Cumana CCD2000S 3.5"+5.25" with PSU £282.17

MODEMS

Nightingale with Commstar £135.00
Voyager 11 £99.95
WS 2000 £108.69
Modem 1000 (BT approved) Special Offer £35.00

NEW TORCH RANGE

Z80 processor board with software £229.00
Twin floppy drive unit £283.00
Both above combined at £459.00
20 MB Hard plus one floppy unit £826.00
40 MB Hard plus one floppy unit £1125.00

Massive range of torch software available.

SPECIAL SOFTWARE

Torch Turbo Library - Special functions & procedures for Turbo Pascal to access the power of BBC/Torch facilities.
Newnet - Powerful friendly Torchnet Management software with password protection, etc.

dBASE SPECIAL

dBase helper programme now available for those who do not want to learn programming in dBase, but need the powerful facilities quickly.
Price only £40.00

Computers by Post

LOWEST U.K. PRICES GUARANTEED



PRINTER RIBBONS

		2+	5+	12+
ACORN	AP80	£2.70	£2.20	£2.00
	AP100	£2.70	£2.20	£2.00
AMSTRAD	DMP1	£3.90	£3.30	£3.10
	DMP2000/3000	£4.40	£4.10	£4.00
	PCW8256/8512	£4.30	£4.00	£3.80
BROTHER	HR5	£3.00	£2.80	£2.60
	HR15 Corr	£2.90	£2.50	£2.30
	HR15 FAB	£3.30	£2.90	£2.60
	HR15 MS	£3.20	£2.80	£2.50
	HR15 also for HR25/HR35			
	EP44	£2.90	£2.50	£2.30
	M1009	£3.40	£2.90	£2.70
CANON	PW1080A Black	£3.10	£2.60	£2.40
	PW1080A Red or Blue	£4.50	£4.10	£3.80
	PJ1080 Ink Jet Colour. One Off			£10.90
	PJ1080 Ink Jet Black. One Off			£8.90
CBM	1515	£2.70	£2.20	£2.00
	1525	£2.70	£2.20	£2.00
	MPS801	£3.60	£3.00	£2.80
	802/1526	£3.70	£2.90	£2.70
	803	£3.40	£2.90	£2.70
	MPS1000	£2.70	£2.30	£2.10
	4022	£2.70	£2.30	£2.10
	MSC801 Colour. One Off			£18.50
	DPS1101 SS	£2.40	£1.90	£1.75
	DPS1101 MS	£2.90	£2.50	£2.30
	DPS1101 Corr	£1.80	£1.50	£1.40
CENTRONICS	GLP 1/2	£3.40	£2.90	£2.70
CITIZEN	120D	£5.00	£4.60	£4.30
DAISYSTEP	2000 MS	£3.10	£2.60	£2.40
	2000 FAB	£4.90	£4.20	£4.00
EPSON	MX/FX/RX80 Black	£2.70	£2.30	£2.10
	MX/FX/RX80 Red or Blue	£3.90	£3.20	£3.00
	100 Series	£3.70	£3.30	£3.00
	LX80/LX86	£2.70	£2.30	£2.10
	JX80 Colour. One Off			£18.50
	LQ800	£3.70	£3.30	£3.10
	LQ1000	£4.50	£3.90	£3.60
JUKI	6000/2200 Corr	£3.10	£2.70	£2.50
	6100 MS	£2.90	£2.50	£2.30
	6100 SS	£2.40	£1.90	£1.75
	6100 Corr	£1.80	£1.50	£1.40
KAGA	KP810 Black	£3.10	£2.60	£2.40
	KP810 Red or Blue	£4.50	£4.10	£3.80
M/TALLY	MT80	£3.70	£2.90	£2.70
OKI	80/82	£1.40	£1.10	£1.00
	84	£3.90	£3.40	£3.20
	Mate 20 Colour	£7.00	£6.50	£6.20
	Mate 20 Black	£6.60	£6.20	£6.00
PANASONIC	Dot Matrix	£5.00	£4.60	£4.30

QUENDATA	DWP1120 MS	£3.10	£2.60	£2.40
QUME	DWP1120 FAB	£4.90	£4.20	£4.00
	Sprint 7/9 MS	£2.80	£2.30	£2.10
	Sprint 7/9 FAB	£4.00	£3.70	£3.40
SEIKOSHA	GP50	£6.00	£5.50	£5.20
	GP80	£2.70	£2.20	£2.00
	GP100/250	£2.60	£2.20	£2.00
	GP500/550	£3.90	£3.30	£3.10
	GP700 Colour. One Off			£18.50

SHINWA	SP1000	£6.00	£5.50	£5.20
SMITH	CP80	£3.70	£2.90	£2.70
CORONA	Fastext 80 (Twinpack)	£11.70	£11.20	£10.90
	TPI M/S			£12.50
	TPI Fabric	£5.70	£5.25	£4.95
	TPI Corr	£5.00	£4.70	£4.50
	D100/200	£4.80	£4.40	£3.90
	D300	£6.00	£5.50	£5.30
STAR	DP/GEMINI/SG	£1.40	£1.10	£1.00
	SR15	£4.90	£4.50	£4.30
	NL10	£5.00	£4.40	£3.70

LOCKABLE DISK BOXES			
MODEL	SIZE	CAPACITY	PRICE
DD40L	3"/3.5"	40	£8.50
GS100	3.5"	100	£13.90
DD50	5"	50	£8.90
DD100	5"	100	£11.70
LIBRARY CASE	5"	10	£1.50

NON-LOCKABLE DISK BOXES			
	3/3.5"	24	£7.20
MD12/30	3/3.5"	24	£7.20
MF50	5"	50	£8.00

COMPUTER STATIONERY			
SIZE	GSM	QUANTITY	PRICE
11 x 9 1/2	60	2000	£12.50
11 x 9 1/2	70	2000	£15.50
EXACT A4	70	2000	£20.90
11 1/2 x 9 1/2	90	1000	£13.20

LASER PRINTER CONSUMABLES			
TONER CARTRIDGES		PRICE	
Epson GQ3500	£18.50	Canon A1/A2	£74.95
Oki Laserline 6	£18.50	Canon A8 Mk II	£84.95
HP Laserjets	£74.95	QMS K8	£74.95
HP LaserJet MkII	£84.95	Citizen Overture	£22.95

PRINTERS

Silver Reed EXP500	£159.95
Epson LX800	P.O.A.
Epson FX800	P.O.A.
Epson FX1000	P.O.A.
Epson EX800	P.O.A.
Epson EX1000	P.O.A.
Epson LQ800	P.O.A.
Epson LQ1000	P.O.A.
Epson LQ2500	P.O.A.
Epson GQ3500 Laser	£125.95
Armstrad DMP3000	£149.95
Armstrad DMP3160	£164.95
Armstrad DMP4000	£299.95
Juki 6100	£269.95
Panasonic KXP1081	£139.95
Star NL10 inc F/F	£179.95
Star NX15	£272.95
Star ND15	£342.95

AMSTRAD 1512

PC Office System £669.95

Single Drive Mono Monitor	£429.95
Double Drive Mono Monitor	£529.95
Single Drive Colour Monitor	£589.95
Double Drive Colour Monitor	£699.95
S/D Mono + 20 Meg Hard Card	£709.95
S/D Colour + 20 Meg Hard Card	£809.95
S/D Mono + 30 Meg Hard Card	£799.95
S/D Colour + 30 Meg Hard Card	£899.95

NEW PC1640 IN STOCK AT SPECIAL PRICES — PHONE!

DELIVERY

All consumables and software post free. Hardware £5 + VAT 4 Day. £9 + VAT 24 Hour. Laser Printers £15 + VAT 24 Hour.

COMPUTERS BY POST GUARANTEE If after buying any of the hardware or software in this advertisement, you find the same item offered at a lower price locally within one week, we will refund the difference.

All prices exclude VAT

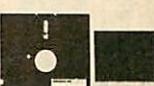
CREDIT CARD HOT-LINE



01-760 0014

Computers by Post (ACU), 14 Emmabrook Court, Sea Road, Rustington, West Sussex.

FLOPPY DISKS



BOXES OF 10 DISKS

1-2 3-9 10+

£9.99 £9.50 £9.25

£11.99 £11.50 £11.25

£15.99 £15.50 £15.25

£26.99 £25.99 £25.49

5 1/4"

JVC inc Plastic Case

MD-1D S/side D/dens 40TR

MD-2D D/side D/dens 40TR

MD-2D D/side Q/dens 80TR

MD-2HD D/side H/dens 1.6MB

MEMOREX

MD-2D D/side D/dens 40TR

MD-2D D/side Q/dens 80TR

MD-2HD D/side H/dens 1.6MB

VERBATIM — DATALIFE

MD525 S/side D/dens 40TR

MD550 S/side D/dens 40TR

MD577 S/side Q/dens 80TR

MD557 D/side Q/dens 80TR

FUJI

"S/side D/dens 40TR

"D/side D/dens 40TR

*Coloured Disks — red, green, blue, beige. £1.00 per box extra.

D/side D/dens 80TR

3 1/2"

JVC

S/side D/dens

SONY/FUJI

FUJI/

MEMOREX

D/side D/dens

SONY

3" DISKS

CF2 5 Disks £2.89 each

CF2 10 Disks £2.49 each

£24.90 pack

PRICES PER 10 DISKS

20 disks 50 disks 100 disks

£8.50 £8.00 £7.50

£8.75 £8.25 £7.75

£8.75 £8.25 £7.75

£11.90 £11.50 £11.25

£20.95 £19.95 £17.95

Bulk Disks

5 1/4" SS/DD 40TR

5 1/4" SS/DD 40TR

5 1/4" DS/DD 80TR

5 1/4" DS/DD 80TR

5 1/4" DS/DD 1.6MB

5 1/

LETTERS

Write to Letters, Acorn User, 141-143 Drury Lane, London WC2B 5TF

STICKING WITH SOFTWARE

Sir, I refer to your article on page 155 of the July 1987 issue of *Acorn User*, 'Book Publishers Bale Out'.

Although I cannot speak for all the publishers you mention, I would like to suggest that you overstate the case that educational book publishers involved with software publishing are tending to drop their software publishing activities. Certainly here at Cambridge University Press we retain a commitment to educational software publishing, and our rate of new publications in this field is not expected to drop.

It has to be conceded that with the demise of the Microelectronics Education Programme, and the corresponding ending of funding for software development units throughout the country, there is less new educational software currently being developed. It is also true that educational software development is not usually commercially viable if funding comes only from the publisher.

There are, however, alternative sources of development funding. We are involved, for example, in agreements with both the British Council and the British Museum (Natural History) to bring further good educational software onto the UK market.

We plan to continue to publish the highest quality educational software.

T Hardy
Cambridge University Press

PUBLISHERS STAY PUT

Sir, In reply to your report headed 'Book Publishers Bale Out' in July, I can state categorically that Longman Micro Software has no plans to withdraw from the software market. Quite the contrary. We are expanding our list of software titles for both primary and secondary schools on a range of micros: BBC B, Master, Nimbus, IBM and Apple.

We are funding several major developments, some of which will run into the 1990s, and continue to take on further commitments. Our funding of Loughborough University was only one of a number of projects, and it ran its planned course, finishing in 1986.

It is true that we, like all educational software publishers, are concerned about schools' ability to afford quality supported software. But this is nothing new to educational publishers who are accustomed to supplying markets that are badly underfunded.

We believe it is important that Longman, and the other educational publishers who have made a serious commitment to software, stay in the market to provide a degree of stability. While a number of 'smaller houses dedicated to software alone' are still very active, many more have disappeared without trace.

These comments are not intended to be derogatory about 'smaller houses' or 'grass-roots' programmers. The schools

market needs a wide range of different types of products from different types of suppliers and we are all helping to increase awareness.

It is important for suppliers and their customers in schools and colleges that we maintain confidence in the whole educational software industry and in its products.

M Spincer
Longman

GEOGRAPHY PROGRAMS LOST

Sir, I have read with interest your article in the June 1987 *Acorn User* entitled 'Maps and More' and am writing to express my concern that you do not refer to any of the pieces of geography software produced by the Computers in the Curriculum Project.

You state: 'A glance through software lists will reveal numerous examples of grid reference programs and yet little in the way of modelling or theme-related simulations.' But a look at the current Longman catalogue will reveal the existence of 15 of the very simulations that you seek. All these run on the BBC.

Are you not aware of this rich source of software that is available to you, or is there perhaps some other reason for their omission?

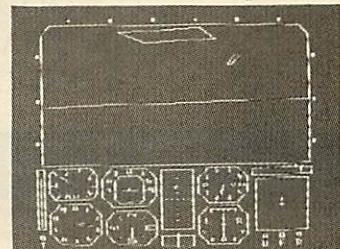
D Watson
Computers in the Curriculum

Our apologies for the omission, but Ms Watson's own book on the subject was men-

tioned in the article as a valuable source of information.

NO JOY WITH AVIATOR

Sir, Following your recent article on flight simulators, I noticed your 'test pilot' stated that it was easier to use an analogue joystick on Acornsoft's *Aviator* program. However, I have had problems



Aviator: joysticks hard to get

in finding a non-self-centering joystick in the shops.

S Almack
North Yorkshire

The original Acorn joysticks are sometimes still obtainable, but if you can't find any, then the centering springs can easily be removed from the Vultec Delta 3B joystick range.

COMMS QUERY

Sir, I found your excellent articles on communications in the July issue very informative but, apart from electronic mail and home banking, they did not tell me much about what else can be done or what information is available. Can I dial up and read the pages of *Encyclopaedia*

Archimedes

WE ARE NOW ACORN APPROVED ACORN DEALERS

	Basic	Mono	Col
Archimedes 305	916.60	974.10	1146.60
Archimedes 310	1004.00	1061.05	1234.00
Master	458.85		
Turbo Second Proc	125.75	457.35	629.85
512K Second Proc	228.85		

We are a new company selling Acorn and related products with I hope a fresh approach and to this end will need people to contribute their expertise to add-ons and software. To help us find suitable people I would like to make an offer of discounts on hardware/programming tools, to Hardware/software developers.

Telephone No Workshop: 01-521 1784

AUTOMATIC SERVICES,
217 WOOD STREET,
WALTHAMSTOW
LONDON E17

OXFORD PASCAL

BBC B
MASTER
ECONET

Oxford Pascal is the most popular full extended implementation of PASCAL for Acorn machines.

"The code produced is very compact" Acorn User

"I can wholeheartedly recommend it to Pascal novices and experts alike"

Computer Weekly.

The Oxford Pascal package contains

- 1) A Resident compiler. This compiler runs entirely in RAM and provides a very fast and convenient way to learn the language and debug programs. Using the resident compiler is like using a BASIC interpreter in that programs are ready to run in seconds.
- 2) A full disk to disk compiler producing relocatable object files. This compiler is capable of compiling very large programs (e.g. the compiler itself!)
- 3) The LINKER. This extension to standard Pascal allows you to break up programming tasks into small separately compilable files and then link them together into a single object module. Whenever you make a change to a file you need only compile that file and relink. Because you can work with short files you can use the resident compiler even for developing large programs.
- 4) The LOCATOR. This utility allows you to produce stand alone programs which run on any machine without the Pascal system.

Oxford Pascal allows many extensions to standard Pascal including:

* program chaining	* Machine code calls with parameters	* String input
* sound extensions	* Graphics (Move, draw, plot etc)	* Clock access
* Bit manipulation	* Hexadecimal numbers and I/O	* Peek, Poke etc
* Random numbers	* Run time error trapping	* AND MORE

ECONET USERS

Oxford Pascal is now available for the ECONET with BBC B or MASTER stations and is installed in numerous educational sites in the UK and Europe. Call us for details.

This month's special offer.

Oxford disk Pascal for the Master £59.95 £49.95



S.S.O.L. 16B WORCESTER PLACE, OXFORD OX1 2JW Tel: (0865) 54195

Please rush me: - OXFORD PASCAL FOR THE BBC B (DISK) 40T 80T £39.95
OXFORD PASCAL FOR THE MASTER (DISK) £59.95
OXFORD PASCAL ECONET INFO PACK FREE

I enclose cheque/postal order for _____
(prices include VAT, please add £1.00 pp UK, £3.00 overseas).

NAME _____

ADDRESS _____

PHONE _____

Allow 14 days for delivery.

MAKE ALL CHEQUES PAYABLE TO S.S.O.L.

RESCUE

STAR
DEVICES

An Educational Adventure on disc
for BBC B or RML 480Z Microcomputer.

from

STAR DEVICES LIMITED
THE CONCEPT KEYBOARD
SOFTWARE HOUSE

Available for the A3-128 or A4-128
CONCEPT Keyboard
Complete with 31 Supporting Work Cards

*** £32.20 ***

Inclusive of VAT Carriage and Insurance
STAR DEVICES LIMITED

Harman House
Andover Road
Winchester
Hampshire
SO23 7BS

Tel: 0962 63626

These materials were developed as part of the
Microelectronics Education Program for
England, Wales and Northern Ireland.



Can I try Elite now?

Our staff are well trained and friendly, and fully prepared to answer all your queries about our wide range of software and hardware. We are official Acorn dealers and take pride in efficient and friendly service. By the way, Tristan, the cuddly dog in the photo is an expert of Sabre Wulf.

NUMBER ONE IN BROMLEY

Data Store

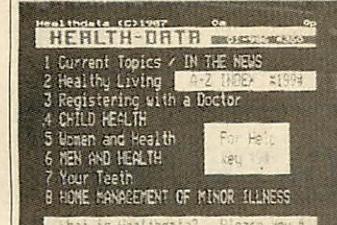
6 Chatterton Road, Bromley, Kent. 460 8991

LETTERS

Britannica or the books of the reference section of my public library? I have no idea, but if I could, it would certainly make a modem a very economic and worthwhile proposition. If not, the system has a long way to go! Learning how to access pages of Prestel is all very well, but what is in them? Can one seriously expect the home computer user to justify the use of a modem, and the increased telephone bill, in order to buy the odd train ticket? I think not.

J Snoad
London

Communications is an expensive business, and unless you have a real need for the information available 'on-line', then it is hard to justify. But



Healthdata's on-line information

there are all sorts of services available over the phone including electronic mail, credit references, news summaries and bibliography searches.

BODGED BATTERY

Sir, Recently I had to buy a Master 128. When I opened it to fit a ROM I was disgusted to see what must surely be one of the most amateurish pieces of British component design ever.

In a personal computer costing nearly £500 we have a battery back-up unit lying loose inside, consisting of three Duracell alkaline 1.5V batteries very crudely wired together and contained in a heat-wrapped polythene package.

I wonder what Acorn would

think if someone sent a photograph of this unit to Amstrad?

E Allchin
Somerset

The Duracell battery pack replaced the original lithium batteries for safety reasons. Acorn originally stated that the Duracells were temporary, and that it would supply a redesigned battery nest.

ARC ADD ON

Sir, At last Acorn leads the field again. Congratulations.

The Archimedes series has enough potential to see Acorn into the 1990s as leaders provided they can market the product properly, and quickly create a sizeable user base.

But what of the Beeb owners who stuck with them through the lean years, perhaps even parting with hard-earned cash to upgrade to a Master? Sales of the Master have helped to maintain Acorn through the past 18 months. So what reward is there? Can Acorn do no better than ask us to splash out another £1000 for its new machine?

So come on Acorn! Archimedes is a super machine for those with the money, however many of your supporters have little of this left after spending a small fortune on Bees, Masters, peripherals and software. Since ARM was developed as a co-processor on a Master it must be feasible to launch an ARM upgrade to provide a reward for the faithful, and a low-cost entry point for RISC technology which will maintain the importance of the Master as a worthwhile machine in its own right.

Acorn needs a large user base for Archimedes quickly before other firms catch up. An ARM co-processor for the Master

must be one of the quickest ways to achieve this!

Rev A B McMullon
Lancashire

It is perfectly feasible, and the ARM development system was configured as a second processor. But part of the appeal of the Archimedes is its graphics and sound facilities. A co-processor could supply the processing speed of the ARM chips, but would be limited to the input and output facilities of the BBC B or Master as was connected to.

ARCHIMEDES ASSURANCES

Sir, I need some reassurance about Acorn's intentions with the Archimedes, given its apparent track record with some past products.

■ Can we have Acorn's assurance that it will support all aspects of the new machines? ■ Archimedes, Acorn claims, contains the fastest processor costing less than £1000. In my mind a great deal of confusion exists between MHz & MIPS – not in dictionary terms, but in real time.

I may appear to be looking for faults, but I am already sufficiently impressed with the Archimedes to be seriously considering purchasing a RISC-based machine.

G Swain
Middlesex

The 'speed' of the processor is sometimes measured in MHz – a million clock ticks per second. Speed is also measured in MIPS – a million instructions per second. Many 16- or 32-bit computers run at 10 or even 16MHz, but one instruction may take many clock ticks, so 16MHz might mean only 2 MIPS. RISC chips like the ARM do most instruc-

tions in only one or very few clock ticks, so an 8MHz Archimedes does about 4MIPS. Of course the real speed is only available to new software written for the Arc; emulation of another machine takes much of the power away. Clearly Acorn will support all parts of the Arc design, as long as there is a market to justify it.

DOTFILL DIFFICULTIES

Sir, I have been having some difficulty with Peter Sandford's assembly language listing for the Dotfills routine, published in the January 1985 issue of *Acorn User* (yellow pages, listing 2, page 112). I was prompted to look up the listings by his more recent articles in this year's January and February issues of the magazine.

After checking the program thoroughly for typing errors, I still get 'Syntax error at line 320' followed by 'Bad program' when I run the program on my BBC Master 128.

D Stewart
London

The listings were published before the advent of the Master series. On a BBC model B, PAGE is set to &1900 if you have a disc drive. The Basic program loads at &1900, and assembles the machine code at &1200, well out of the way. On a Master, PAGE is always set to &E00, so the Basic program loads there and proceeds to assemble the machine code on top of itself. So try this addition to the program, assuming you have called listing 1 'DOTBAS':

55 IF PAGE<&1500 THEN
PAGE=&1500:CHAIN"DOTBAS"

This loads the program higher up in memory, out of the way of the machine code.

DABHAND

A U O F F E R

Bruce's bumper bundle



This amazing five-item offer is a must for those interested in machine code programming. Normally costing £38.75, we are offering this excellent package to you for the special price of only £14.95. Included are:

- *BBC Micro Assembly Language* by Bruce Smith – a superb 200 page introduction
- Accompanying disc containing 60 programs
- Bruce Smith's *BBC Micro Assembler Workshop* – an advanced book containing many useful utilities.
- Accompanying disc with another 30 programs
- *Fingerprint* – a brand new, powerful 6502 machine code monitor/disassembler/memory editor.

Further details are available from the address below.

Please send me:

____ Bumper bundle(s) without *Fingerprint* at £9.95
 (£21 discount)
____ Complete bumper bundle(s) at £14.95 (£24 discount)
I enclose a sterling cheque/PO payable to DABS PRESS for £ ____ (Outside UK add £2 p&p. Free p&p in UK).

NAME _____

ADDRESS _____

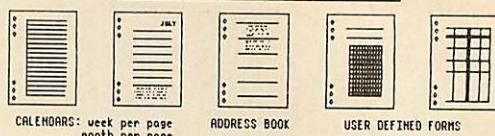
POSTCODE _____

SIGNED _____

DATE _____

Send with your remittance to Assembly Offer, Acorn User Merchandising, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.
Please allow 28 days for delivery.

FAX • FILE ORGANISER



CALENDARS: week per page
month per page

ADDRESS BOOK

USER DEFINED FORMS

Combine the power of your BBC with the flexibility and convenience of a personal organiser (Fax, Lefax etc) to create a personalised database. Using filofax-size computer paper or single sheets to:

- Print calendars including personal data (on disc file)
- Print Address-book pages, up to 48 entries sorted by name
- Print custom designed forms eg Class registers, accounts etc

The program (by Mike Williams, author of *The Experimenters ROM* and of *BBCsoft's Electric Fields*) is menu driven and very easy to use. It comes with full instructions and a pack of special size computer paper. (Extra paper can be purchased as required).

£9.95 inc p&p
88 track disc
sample pack of computer paper

MEWsoft
11 Cressy Road
London SW3 2HB

Also from MEWsoft – *THE EXPERIMENTERS ROM* £22 INC. P&P
"Very impressive. This ROM should prove invaluable to my teacher performing in experiments involving computer control or monitoring hardware. (School Scheme Review Sep. 1986)

CYGNET ELECTRONICS

RAMWISE 16K RAM module For the BBC B & B+ micro

ONLY £21.00

Expand the ROM capability of your micro without the need to fit expensive ROM boards, RAMWISE is an easy to fit and easy to use 16K sideways RAM module.

- No soldering required
- Small module plugs into any spare ROM socket
- Low power CMOS RAM chips used
- Already used in schools and colleges on ECONET and E-NET systems
- Runs all existing ROMS
- More than one module can be fitted
- Write protect switch included
- Compatible with RAMWISE II board and can be used on ATPL board

RAMWISE II

32K RAM/ROM board for BBC B micro NEW LOW PRICE £36.95

This board provides 2 EXTRA ROM sockets + 2 banks of 16K sideways RAM.
• Battery backup for 32K RAM as standard
• Write protect switch controls both banks of RAM
• No soldering required
• Direct load from disk to SWR using *LOAD (atsp)
• FREE utilities disc to load and save ROM software for RAMWISE & RAMWISE II.
State 40 or 80 track disc.
Education Discounts available
FREE P&P. Cheques, P.O. etc. to:
CYGNET ELECTRONICS, PO BOX 27, Bordon, Hants GU35 0HH. Tel: (04203) 5229

MID SUSSEX SOFTWARE



MUSIC PRINTING

- ★ The music processor from Mid Sussex Software produces printed music to professional standards.
- ★ Easy music entry for single parts or scores, editing, transposition, extraction of parts from scores, playback.
- ★ Price £49.95 – State 40/80 Track, BBC B or Master.

NEW MUSIC PROGRAMS

- ★ Three new programs for use in music education – available in September

★ Pitch Trainer

★ Rhythm Tutor

★ Listen Carefully

£9.95 each

State 40/80 Track

Send for more details to:- Mid Sussex Software, 11 Bridle Way, Pound Hill, Crawley, West Sussex RH10 4HP or telephone HORSHAM (0403) 54922.

LETTERS

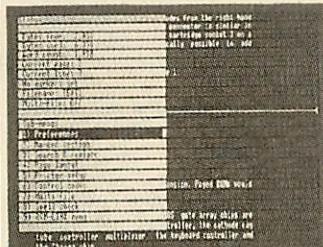
TOO

MUCH SPACE

Sir, I have recently acquired Computer Concept's *InterWord* and *SpellMaster* and I regard these as the best so far in the BBC wordprocessing field.

One annoying problem is that *SpellMaster* automatically claims work space when it senses *View*. Good if you are using *View*, not good if your other programs need all your memory to work.

I find that every time I use the computer I have to type in *WORKOFF to disable this facility. Surely it would have



Convert from *View* to *InterWord*

been better to have left it as an option that could have been put in the relevant !BOOT file.

InterWord itself is a very friendly program and I now use it almost exclusively. Is there a simple program or software to change *View* files into *InterWord* compatible ones? When I tried it I lost not only the letter in question but all the files on the disc.

R B Vočadlo
Buckinghamshire

To transfer from *View* to *InterWord*, you have to create an ASCII file containing your text. From *View*, either use the ASCII spooler published in *Acorn User*, July 1986, or this method:

```
LOAD <viewfile>
*SPOOL <asciifile>
SCREEN
*SPOOL
```

Then read the ASCII text into *InterWord* using 'Load text to cursor', menu option 4.

PARISH PRINTING

Sir, I enclose a copy of our magazine - the Biddulph Moor parish magazine - produced using *Stop Press* and *InterWord*. For *InterWord* I use an A5



Rev McGuire's parish magazine

template. The printer is an Epson FX100 and I find the codes for ideal print are 27, 33, 26. This is just right for an A5 sized page.

When all the pages have been printed out, I then photocopy them to 'black' them; put them through an electronic scanner and then duplicate. We sell 170 copies and make a profit! Speed is essential in any small regular production and *InterWord* and *Stop Press* are ideal for this.

Rev J McGuire
Staffordshire

BREAKING THE PAGE

Sir, May I make a suggestion to those who bemoan the lack of a page break indicator in *View*.

There is a command PE n, where n is a number. If n is greater than the number of lines remaining on the page, a page eject is performed. For example, if you have a table which takes 12 lines, put the command PE 12 immediately before it. If there are 12 or more lines left on the page, the

table will be printed out; if not, the table will be printed on the next page. Similarly PE 2 before each paragraph will ensure that there is never a single line left at the bottom of a page.

I even find this technique useful with *Wordstar*, which does display page breaks. Liberal use of the command means that amendments can be made throughout a document knowing that page breaks will not come in unwanted places.

J Kitchen
London

PAGING VIEW

Sir, I use the disc version of *View* 2.1, and find it excellent, with the exception of one feature: I cannot control the page eject. If I type a paragraph of text in and proceed to test print it, the page ejects every time. Can page eject be cancelled in *View* 2.1, or do I need an upgraded version of *View*?

R Dean
Leicestershire

View 2.1 always feeds to the end of the page after it finishes printing. Version 3 allows you to switch this off using the 'PB off' command.

WRONG LEAP

Sir, Regarding Bob Cornford-Wood's article on the Music 500 and 5000 in the April issue, I have only recently bought a Music 500 and have had my own struggles with Ample, so it is worth pointing out to other neophytes that entering listing 1 in the article is necessary before entering listing 2. The former sets up dummy word definitions to avoid precisely the problems described. I found this out the hard way,

ignoring listing 1 and defining words from listing 2 in an order calculated to overcome this, leaving 'play' and 'setup' in particular until last. Line numbers are not essential: I didn't use them.

It helps if commas are added to the ends of some of the lines: line 10 in 'part2D', line 10 in 'part3B', lines 10, 20 and 50 in 'part3C' and line 10 in 'part4C'.

Overall I thought it a very good idea and look forward to more Ample listings.

B Goatly
London

There is a user group for Ample addicts. Contact them at 18 Blackmead, Orton Malbourne, Peterborough, Cambs PE1 0PU - an annual subscription costs £10.

AMPLE EFFORTS

Sir, I write to tell you about an interesting fault in Joe Telford's calendar programs in August's *Acorn User*.

1900 and 2100 are not leap years, but 2000 is, because it is divisible by 400. Joe's programs do not follow this rule and make every centenary year a leap year!

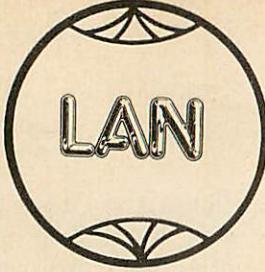
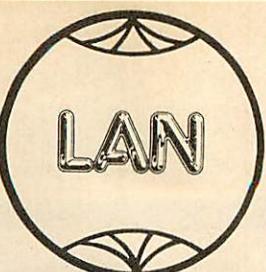
This problem can be corrected as follows. Taking the example of the 'Annual Calendar' (listing 3), the following two lines need to be added to the original program.

```
582 IF (month>2) AND
((yr MOD 100=0) AND ((yr
DIV 100) MOD 4<>0)) THE
N ed=ed-1
```

```
632 IF (month=2) AND
((yr MOD 100=0) AND ((yr
DIV 100) MOD 4<>0)) THE
N 1 last=last-1
```

Similar lines are needed in listings 2, 4 and 5 to make them function correctly.

G Rainey
Somerset

**LAN****LAN****LAN****COMPUTER SYSTEMS LTD****Bringing the World of Technology to your fingertips****MASTER 128 K**

Complete with internal software and manual

NEW EPSON LX800
150 cps, 25 at NLQ

£339.00

PANASONIC KXT1081

Complete with paper and BBC Cable

£149.00

3½" DISC DRIVE
Cumana CS354
drive with power supply unit**CSX 100**
Cumana CSX 100
40 track drive

£89.00

£89.00

£219.00

Medium resolution colour monitor

MICROVITEC 1451**TOP
TEN****CSX 400**
Cumana 40/80 track switchable disc drive**LAN 510**
Box of ten 5½" diskettes, DSDD, 96 TPI in plastic library case suitable for 40 and 80 track drives.

£109.00

£8.65

£232

£69.00

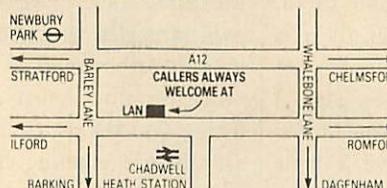
High resolution green or amber monitor

PLINTH DRIVE
Dual 40/80 track drives horizontally mounted in monitor stand to fit both BBC & Master Series**ZENITH MONITOR****RING NOW EDUCATION CATALOGUE AVAILABLE**

DRIVES	PRINTERS	MONITORS	MISC
Cumana Drives			
CSX100	EPSON LX800	£199	MASTER COMPACT
CSX400	MP201	£289	MASTER TURBO
CS400	MP165	£179	MASTER 512
CD800	EPSON LX86	£199	1770 DFS
CS354	STAR NLIØ	£199	8271 DFS
CS358	PANASONIC 1081	£149	PRINTER STAND
Winchester Drive	CANON PW1080A	£229	MASTER EPROM CART
V20MB	EPSON FX86	£349	AMX MOUSE
Plinth Drive	MP26	£249	IEEE INTERFACE
VPLIN	JUKI 6100	£279	CHOLO
		£16	£12

LAN VOUCHER**£1.00 OFF EVERY £10.00**

off software purchased in the computer centre

COME IN AND SEE US1063 HIGH ROAD,
ROMFORD, ESSEX
TEL: 01-597 8851**HOW TO ORDER**

Post order form to us. Telephone orders accepted if confirmed in writing. All orders will be acknowledged. Goods can be collected or delivered.

DELIVERY CHARGESBelow £10 add £1.50 Below £50 add £2.50
Below £100 add £3.50 Above £100 add £8.00

PRICES EXCLUSIVE OF V.A.T. AND CORRECT AT TIME OF GOING TO PRESS.

Education callers ask for:
Tony Judge or Mike Brown

LETTERS

TWO INTO ONE

Sir, I have a BBC B, a Cumana single disc drive and an Opus single disc drive. Is there a way to connect the disc drives to make a double drive?

J Briggs
Norfolk

Yes, two single disc drives can be converted to a 'dual' unit. It can be done by changing a few links inside the drives. Your Cumana drive should have come with a manual illustrating the links; you need to change the drive address, by altering the link on the pins labelled '0' to the pins labelled '1'. Then get a dual drive ribbon cable, and remove the 'terminating resistors' from the drive not on the end of the cable.

The simple way is to use a special dual unit connector kit (DUCK) to plug the drives together. You don't need to modify them at all. DUCK costs £17 from Viglen, Trumper's Way, Hanwell, London W7 2QA.

LONG CALL

Sir, Here's a cautionary tale about modems. Beware of a possible clash between the modem software and any extra hardware installed.

I purchased a BT-approved Magic Modem from Dataphone and used it on Prestel. Barely two weeks later, I received a quarterly phone bill for a crushing £173, twice the largest for any quarter in two years.

It dawned on me that the modem probably did not automatically drop the phone line when I logged off, and tests showed this to be the case. My phone meter was totting up the

units for most of the final 12 days of the billing period.

I now always jiggle the telephone handset after each shutdown to make sure there's a dialling tone. So be warned!

D Scott
London

Good advice. Dataphone is now aware of a problem with its software and some types of Solidisk sideways RAM, and it is working to rectify the trouble as soon as possible.

ARCHIMEDES IN ENGINEERING

Sir, As an engineer I have long awaited a micro for the home market which offered 32-bit architecture, expansion to 4Mb and high level languages such as Fortran 77 almost as standard. This appears to be promised with the Archimedes.

For the user with more 'professional' applications in mind, the A410 would be an excellent starting point within the Archimedes range. However, the cost will doubtless relegate many to the 300 series systems.

If, as stated in your August edition, there is scope for discount with volume purchases, might there be scope for groups of people to benefit from such reductions?

P Shepherd
Avon

One of the major advantages of the Archimedes for scientific or industrial use is that existing Fortran programs should be usable. The cost of the 410 will be £1610, £600 more than the 310; the hardware differences are the four-slot backplane for podules, the hard disc drive controller and extra circuitry to handle very high resolution monochrome screen modes. Acorn is tight-lipped on further bundled

software. As implied in the August article, discounts are available only for volume educational buyers.

PSYCHEBROT THANKS

Sir, I must thank *Acorn User* readers for their generous donations to MIND. Following the article 'Return of the Mandelbrots' in the May issue, and my letter (published in the July edition), I have had over 100 requests for copies of the free *Psychebrot* software.

As most people sent their donations directly to the mental health charity, MIND, I don't know the total collected so far. However, estimating from those who asked me to forward their donation for them, *Psychebrot* had probably raised £500 by the end of July. Obviously I will continue to distribute the *Psychebrot* software for as long as the donations keep rolling in.

Chris P Reynolds
33 Buckingham Road
Tring, Hertfordshire
HP23 4HG

SIDEWAYS WRITINGS

Sir, Can you tell me when *Acorn User* carried an article about sideways RAM, and where can I get back issues?

J Burfoot
Essex

We published an article by Mike Rawlings about using sideways RAM to store data in March 1986, and a second article about storing programs in sideways RAM appeared in September 1986. Back issues cost £1.75, and can be ordered with the form on page 129. Phone orders are taken on (0672) 40825.

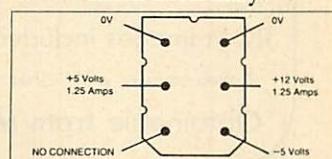
POWERING UP

Sir, I wish to power an electronic circuit using the auxiliary power output underneath my BBC B micro.

Could you print a diagram of the pin connections of this socket?

Simon Spooner
Yorkshire

The auxiliary power output is shown below. If you use this output, take care not to overload the power supply, particularly if your micro has any extras fitted internally.



Auxilliary power output pins

SHIFTING THE FUNCTIONS

Sir, The Article 'Cut Down on Keystrokes' by Graham Bell in the August edition of *Acorn User* should usefully fulfil a need in using *View*. But I am unable on a BBC Master Compact to generate editing functions in the function keys using the codes provided in spite of using *FX228,1. CTRL-Shift-fn generates only the extended character range for ASCII codes over 128. Can Graham Bell's procedures be applied to the Compact?

J B Walls
West Yorkshire

The Compact version of *View* (shown as *View 05* if you type *ROMS) deals with the CTRL-Shift function keys differently to the versions on other BBC micros. The only way to use the extra functions is to plug in an earlier version of the *View* ROM.

As seen at the
ACORN USER show

Mijas Software

Helping to bring the new software world to YOUR BBC micro

'A Book on 'C'
Berry and Meekings
£8.50

First on the BBC B and MASTER
with a relocatable assembler and linker

First on the BBC B and MASTER
with Assembler Source-Level DEBUG

65(C)02
Development System

The MIJAS 65(C)02 development system is a proven way of writing good assembler software. It brings large machine facilities to YOUR MICRO. Use it for games, technical, business software or language compilers.

Fully relocatable code modules are produced, one at a time or in groups, which are built by the LINKER into a complete program together with other modules and/or modules selected automatically from libraries.

Updates and re-assembly need only be done for changed modules, linking is fast and your final program is complete and tested much quicker.

80T £22
40T (two disks) £25

ROM images included

'Saved hours of work' - User

Now bring you:-

Small 'C'

Producing Assembler NOT p-Code

With

Separately compilable modules

Link ONLY the code you need
from the I/O and 'C' libraries included

Assembler, linker, Source-Level DEBUG
SHELL and utilities included at

Make facility £50 ADFS or DFS

80T plus ROM images

Assembler, Linker Source-Level DEBUG and
Small 'C' system are fully integrated and ideal
for teaching good modern software methods

Special versions for demonstration work
write for details.

Source-Level DEBUG

Source-level Debug enables you to monitor the running of your program looking at the original source code and examining and changing variables by name. It is designed to be used with 'C' or Assembler or any mixture of the two.

A complete module can often be tested and corrected without knowing a single hex address.

Save listing paper, patience and printers! Ideal both for the beginner and for the experienced programmer.

'Why didn't someone write this sooner'

80T or 40T
£20

ROM image included

Tel.
096289352
after 6.00pm



Obtainable from Mijas Software, Winchester Rd. Micheldever, WinchesterHants SO231 3DG
Official orders welcome, site licences available

Word-Ex

"...the best support package yet published
for Wordwise Plus users"

says Jonathan Evans of A & B Computing.

The ONLY ROM support package that works with old
Wordwise as well as Wordwise Plus.

- Menu-driven file access
- Function key editing
- High speed sorting
- Label printing
- Case changing
- Fast word-search
- Extra keyboard functions
- New star commands
- Leaves all segments free
for your own use
- 16k machine code ROM
for only £30

For full details,
contact:-

Norwich
Computer
Services



Write now for a copy of our free magazine, Wordwise Plus Times.

For full details, contact:- Norwich Computer Services, 18, Mile End Road, Norwich, NR4 7QY. 0603-507057

Archive

The subscription magazine for Archimedes users

Edited by

Paul
Beverley

Published by

Norwich
Computer
Services



Articles including:-

- DIY upgrade 305 to 310
- Basic concepts I - WIMP's
- What's new in BASIC V?
- ARM assembly language
- News from Acorn
- Using Wordwise Plus
- System Delta database
- Adding a 5.25" drive

Services to subscribers:-

- File transfer 5.25" to 3.5"
- Special discounts
- Technical advice

Cost:-

- £10 for 1 year
- £6.50 for 6 months

(Prices are for UK only)

HINTS & TIPS

Martin Phillips' advice on using printer drivers, revamping old micros and converting graphics between modes

VIEW PRINTER DRIVERS

A printer driver is a short machine code program that tailors a wordprocessor such as *View* for a particular printer. The printer driver then eliminates the need to put printer codes into the text each time an effect like bold is needed, as in the case with *Wordwise*. The printer driver is usually created by a special program called a printer driver generator. Acorn's *View* printer driver generator offers fewer facilities than many modern printers. I needed a printer driver that would be more flexible than the normal Acorn one with its series of Morse code highlights.

A generator produced by George Hill that allows a larger number of type styles was published in *Acorn User* in June 1985. The generator provided a very satisfactory range of printer codes. However, the generator's method of entering printer codes was rather confusing, and the four-character comments, apart from being too small, were not saved with the driver, thereby making later editing difficult.

The new driver generator on the yellow pages creates a driver that works in exactly the same way as George Hill's driver, and readers who have this issue will find it well worth referring back to George's article. The generator program is quite different, however, allowing all the codes to be displayed at once, together with an 11-character comment. When the driver is saved, two files are in fact saved. Apart from the driver, a 'p' file is saved which contains details not only of the driver but also the comments. The codes are entered and displayed in 27,69-type notation which may be more familiar to some than the ESC 'E' notation used by the original.

The generator presents an editing screen (see figure 1). This screen displays both the printer control codes and comments. From this screen it is possible to add or alter any code. Drivers can be loaded, saved and printed out. The ASCII value for the pound sign can also be changed. The printout option prints an exact replica of the editing screen. The program will accept all inputs in either upper or lower case.

View Printer Driver Generator			
	ON	OFF	
B/P	27,64	9	Reset
A/Q	27,120,49	27,120,48	NLQ
B/R	27,114	27,116	Reverse
C/S	15	18	Compressed
D/T	27,69	27,70	Double
E/U	27,45,49	27,45,48	Underline
F/V	27,77	27,80	Font
G/W	27,87,49	27,87,48	Wide print
H/X	27,104	27,117	Double ht
I/Y	27,52	27,53	Italics
J/Z			
K/C			
L/\	27,83,9	27,84	Superscript
M/\	27,83,1	27,84	Subscript

E..Edit L..Load S..Save
£..Pound Q..Quit P..Print

Enter command:

Figure 1. The *View* printer driver generator sets up programs to enable *View* to run a printer

I know many readers have problems with typing in assembler listings. As an assembler routine is needed in this program, I have taken the assembled machine code and put it into DATA statements, which enables a detailed checksum to be included. At the end of each data statement there is a checksum figure, so the program will not only indicate that there is a typing error in the data, but it will also show in which line the error occurs. The use of an editing-screen-type approach in the program does simplify the procedures and makes the program easier to follow, so it is easier to spot any mistakes in the listings.

When loaded into *View* the completed driver occupies page &400. The first &89 bytes (memory locations) of this page are taken up with the machine code given in the DATA statements. Each printer code is allowed eight bytes. The first byte says how long the start code is. The next three bytes are available for the control code to start the printer effect. The fifth byte says how long the cancel code is, and the final three bytes give the effect cancel code.

The driver will allow up to 14 printer effects to be included. The sequence to

switch on an effect and also to switch it off again needs to be entered in the printer driver generator. If your printer does not accept the normal ASCII code of 35 for the pound sign, then this must be changed.

The left hand side of the screen shows a series of letters associated with each of the codes. By using the available letters carefully it is possible to employ mnemonic codes for many of the functions: my choice is shown in figure 1.

For Epson-compatible dot matrix printers, the codes shown in the box on the next page may be useful.

To enter these into the driver, first press 'E' to edit. You will then be asked which letter you wish to define. The first code we wish to enter will be the underline code. It makes sense to assign this to be 'U' code. Therefore press either 'E' or 'U'. The generator will then ask for the start code, so type in:

27,45,1

or its equivalent on your printer. Then it will ask for the stop code, so enter:

27,45,0

and finally the comment, so enter:

underline

C.S.S.

The Principal Supplier and Maintainer of Micro
Computer Systems to the

CORPORATE AND EDUCATIONAL MARKET IN SCOTLAND

Computer Services Scotland Ltd

WHITEHILL INDUSTRIAL ESTATE
GLENROTHES, FIFE KY6 2RZ

Tel: 0592-773710 Telex: 727706 Fax: 0592-774094

COMPLETE SYSTEM - MICRO COMPUTERS - PRINTERS - VISUAL DISPLAY UNIT - SOFTWARE

HALICE
SOFTWARE/HARDWARE

■ VECTOR 1 ▶

TAPE TO DISK UTILITY FEATURES

- + Once only purchase
- + Can save to any disk
- + Very user friendly, help pages on disk
- + 40/80 Format
- + No awkward ROMs, can be used on any machine
- + Can load to all available RAM 8400-&7FFF
- = Simply the best tape to disk utility available

Vector 1 versions compatible with Acorn, Opus, UDM, Cumana, BBC + & Watford (Not 1-42, 1-43 DFS's.)

■ VECTOR 2 ▶

DISK TO DISK UTILITY FEATURES

- + 40/80 Format
- + User friendly, menu driven
- + Contains powerful features such as a disk sector editor, Disk Compare, format, verify and track repair
- = The most powerful disk utility available

NEW IMPROVED VERSION (1.40)

Send £2.00 with old disk for upgrade.

Prices: £12.00 each for Vector 1 or Vector 2 £23 for both.

Sycke Toolkit £21.95 (Send for full details)

All prices shown include VAT and p&p. Please add £3.00 per disk if you require 3" disks and specify when ordering.

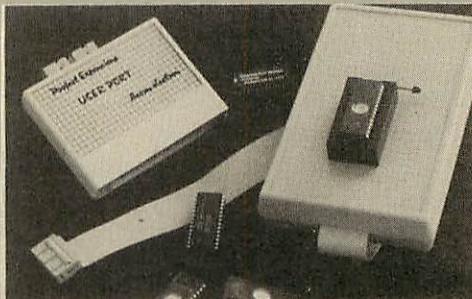
Orders to:

CHALICE SOFTWARE, Dept AU
3 Merlin Way, Covingham,
Swindon SN3 5AN.
Telephone 0793 615026

VECTOR 1 & VECTOR 2
now compatible with
BBC + and Master
series, Opus 1770
and also
Solid-Disk
Issue 2 inc.

PLEASE SPECIFY DFS

PROJECT EXPANSIONS
USER PORT & EPROM PROGRAMMER
for the
ELECTRON



User Port cartridge for the Electron
With ROM socket. PRICE ONLY: £29.95
EPROM Programmer inc ROM software

For 8, 16, 32K EPROMS
All Menu Driven,

PRICE ONLY: £34.95

COMING SOON FOUR CHANNEL CARTRIDGE
ALL THE ABOVE PRICES ARE INCLUSIVE OF P.O. & VAT.
PLEASE SEND CHEQUES/P.O. TO

PROJECT EXPANSION
5 TEAL CLOSE, FAREHAM HANTS PO16 8HG
0329 221109

HINTS & TIPS

This will then be displayed on the editing screen. If you have made a mistake it can simply be re-entered, otherwise just add any other codes required. When the driver has been completed, save it to disc by pressing 'S'. It can always be loaded in again and changes made to it. Do note that there are no checks in the listing to ensure that your filename is sensible or that you are not trying to write to a locked file, so be careful or you could cause an error.

To use the driver, load it in from the *View* command screen and type:

PRINTER <filename>

where <filename> is the name you called the driver when you saved it. Then enter the editing screen of *View*, and at the top of your text add:

HT 2 141

Press Shift-f8 before the HT and Return after HT, as HT is an edit command. Then the printer codes can be used in your text by first pressing Shift-f5 (highlight 2) followed by the letter assigned to that code.

So to start underlining, include

***Utext text text*U**

when * is highlight 2. Put in one highlight for on, and one for off.

PRINTER CODES

27,87,1	Double-width
27,87,0	Cancel double-width
27,52	Italics
15	Condensed mode
18	Cancel condensed mode
27,80	Pica mode
27,77	Elite mode
27,82,0	American character set
27,82,3	English character set
27,69	Emphasised printing
27,70	Cancel emphasised printing
27,71	Double-strike mode setting
27,72	Cancel double-strike mode
27,45,1	Underline mode
27,45,0	Cancel underline
27,83,0	Superscript on
27,84	Superscript off
27,83,1	Subscript on
27,84	Subscript off
27,64	Initialise printer (reset)
The following codes might also be used by some printers:	
27,104	Set double-height
27,117	Cancel double-height
27,114	Set white-on-black print
27,116	Cancel white-on-black
27,120,1	Near letter quality on
27,120,0	Near letter quality off

An important function that should be included in your driver is the reset code. Figure 1 assigns the symbol '@' to this code. The stop character for this code will be a '?'. It is important even with this code to include a stop byte for the driver to function correctly. When using a reset at the start of text always include it twice:

***@*@**

Do make sure that every code is cancelled in the text, otherwise the printer driver will get out of step. The first time the driver meets a highlight it will switch that function on, the second time it will switch it off again, even though it might not be printing the same document.

TAB TIPS

I have recently seen several programs with a line similar to this:

PRINT TAB(10, 10); "Hello"

There is really no need for the semicolon after Tab; it will work perfectly without:

PRINT TAB(10, 10) "Hello"

However, it may be considered good programming practice to include the redundant semicolon.

Where the semicolon is required is when printing numbers. Try the following line:

PRINT TAB(10, 10) N%

Now the number is printed out several spaces to the right of the intended position. This can be overcome in one of two ways. The first one is to change the printing width using @%:

@% = 0

and then print the number. This prevents Basic trying to 'format' the number into neat columns - which is what causes the extra spaces. The better way is to use a semicolon, which forces the number to be printed directly after the Tab position.

PRINT TAB(10, 10); N%

A semicolon at the end of a line like this:

PRINT "Hello";

changes the normal action of the PRINT statement, which usually puts a Return at the end of the 'Hello' so that the next text starts printing on a new line. With the semicolon, no Return is printed, so the next text to be printed will start on the same line, directly after the 'Hello':

PRINT "Hello";

PRINT "all"

will print

Hello all

with both words on one line, not like this:

Hello

all

The other separation characters that you can put into PRINT statements are commas and apostrophes. The apostrophe has the opposite action to a semicolon - it causes an extra Return, so:

PRINT "Hello'" "all"

prints over two lines like this:

Hello

all

Commas don't do anything when you print strings, but with numbers they cause the numbers to be divided into columns.

With the full range of separators, it should be possible to include one between each item in a PRINT statement.

£5

ENTERING LISTINGS

A wordprocessor can be used to great advantage when typing in listings. W K Todd from Colchester wins a quick £5 for this tip. If typing in a listing, then ignore line numbers, but put

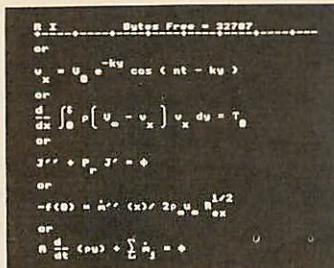
AUTO

at the start of the text. When the text is saved, *SPOOL the file rather than the normal SAVE routine. Then *EXEC the file to load in the program. Line numbers will be automatically generated. If a program has to be modified then using a wordprocessor can make such changes much easier. Here the search and replace facility is most useful.

REJUVENATED MICROS

Many BBC computers are getting a little long in the tooth these days. Common problems on older machines are a tendency for the machine not to start up properly when they are switched on, and for the keyboard not to respond as expected. Sometimes there is an easy cure. With the computer switched off and unplugged, remove the top cover by unscrewing the two large screws at the back, and the two similar ones underneath the keyboard. A grey ribbon lead can be seen joining the main circuit board to the keyboard circuit board. Simply unplug this lead at both ends, turn it round, and plug it in again. Very often the problems will then dis-

SCIENTIFIC WORD PROCESSING



Developed at Edinburgh University, **VUE-SCIENTIFIC** is the first scientific word processing package for the BBC micro.

A promotional pack including Demo Disc and example print-outs of both Letter Quality and draft quality is available at £3.75. We offer two versions of the software.

LQ version including 2 Eproms and user manual.

£49.95

Draft Quality version including 1 EPROM and user manual.

£37.50

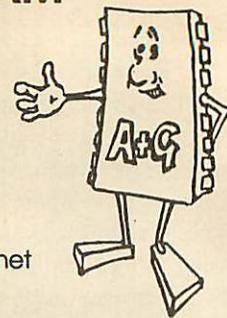
SPECIAL APPLICATIONS DIVISION (AU10)
Intelligent Machines Ltd,
66 Browning Road,
Bushwood Estate,
London E11 3AR
Phone 01-989 5807

BBC B Sideways RAM

32K Unit £16.00

16K Unit £13.00

- Fool proof fitting - No soldering
- 16K Unit Rom Board Compatible
- RW Protect switch as standard
- Each unit requires one rom socket
- Compatible with tape, disc & econet
- Low power slimline units



Sideways RAM & Utility Software Pack v3.0

SWR software (requires 1x16K SWR) Includes:

- Intelligent menu-driven s/w for load/save/test/clearing SWR
- Wordwise mem extension -160preview -Toolkit -Printer Buffer
- Utility software (no SWR req'd) Includes 25+ useful programs:
- Damaged disc recovery -Flood-fill -Disc Imager -Char definr
- Graph plotter -Screen enlarger/flip/compacter plus much more.

Please state 40/80 track, sold with SWR £3.00, separate £8.00

Switching Boxes

User Port	Printer	RS423
1 to 2	£24.00	£14.00
1 to 3	£28.00	£17.00
1 to 4	£37.00	£22.00
1 to 5	£43.00	£27.00
1 to 6	£48.00	£32.00

Prices apply to changers and sharers. Lead length 1 metre

Special prices: AMX compatible mouse ONLY £25 ARCHIMEDES POA

Please send for free catalogue

A&G ELECTRONICS
 14 HURSTWOOD AVE.
 BEXLEY,
 KENT, DA5 3PH
 (MAIL ORDER ONLY)

BT GOLD:72MAG90461
 PRESTEL 322522315

ALL PRICES INCLUSIVE

TRADE & SCHOOL
 DISCOUNTS AVAILABLE

Tel: 0322 521949

A Unique Aid for Science Students

The Nuclides Data Base, a new computer package available from the U.K. Atomic Energy Authority, enables science students to explore some of the concepts at the heart of nuclear physics.

This unique educational aid has a large and rapidly accessible store of invaluable information on such topics as half life, binding energy and nuclear radius.

Designed by science teachers primarily for use by students in the 16-18 age group, the program should also be helpful in nuclear physics introductory courses at tertiary level.

Disk versions of the program are available for the BBC (including BBC Master 128), RM 480Z and RM Nimbus microcomputers. All versions are network compatible.

The package, which includes booklets for teacher and student, costs £12.50 inclusive of VAT and postage.

To obtain further information and an order form please use the coupon below.

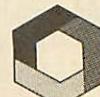
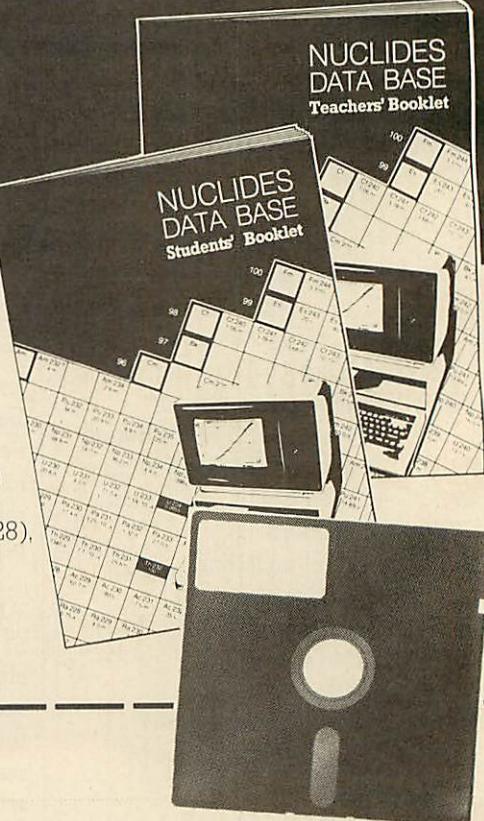
Purchasers will receive a **FREE** copy of an A0 size (841 x 1189mm) chart of the nuclides.

To: U.K. Atomic Energy Authority, Room 119, 11 Charles II Street, London SW1Y 4QP.
 Please send me information and an order form for the Nuclides Data Base.

Name _____

Institution _____

Address _____



UNITED KINGDOM
 ATOMIC ENERGY AUTHORITY
 EDUCATION SERVICE

HINTS & TIPS

appear. The reason this seemingly pointless tip works is that the keyboard link connections become somewhat corroded over time, and just removing and reconnecting the link is enough to produce a good contact again. If the fault recurs after a very short time, then obtain a new keyboard connector.

Why should this affect the way the computer switches on? When the computer initialises itself it looks at some link settings which may or may not be present on the keyboard, sending signals along the keyboard connector to do this. If it is not making a good connection then the computer may not get the right signals back to initialise itself correctly.

INPUT PROBLEMS

While writing the printer driver program, I wondered why the input routine would not work correctly. What I had done was to input a string in the form '27,120,1', separated by commas. This string was then 'decoded' into three separate numbers. All that happened was that the first number only was decoded. After a long and detailed look at that part of the program the penny dropped. The problem lay with the INPUT statement, not with the decoding routine! The INPUT statement will not accept commas, so inputting 27,120,1 into the following line:

INPUT a\$

and then typing:

PRINT a\$

will print out just '27'.

Instead try:

INPUT LINE a\$

Now when a \$ is printed out, the full string will be printed. INPUT LINE will also accept any leading spaces which have been entered into a string.

£5 SPOOLED GRAPHICS

John Chisholm of Design Dynamics noted our piece in June 1987 *Acorn User* about saving graphics displays in a spooled file. The essence of the idea is that instead of saving a screenfull of graphics, the stream of VDU codes used to draw the display can be saved:

***SPOOL <file>**

```
REM draw screen display
*SPOOL
```

The graphics can be reconstituted later using *EXEC to read in the VDU codes.

John writes: 'It's good to see the elegant *SPOOL technique is becoming more widely publicised. But the main benefit of the *SPOOL method was not brought out in the previous article - that you can read back the data in a different screen mode. So a program running in, say, mode 4, could spool its graphical output, then replay it later in mode 0 and gain extra resolution. The original program could even work in mode 7! No graphics would be shown on screen, but the correct VDU codes can be spooled to a file and replayed later in a graphics mode. One caveat - avoid MODE statements in the original program, otherwise they will be spooled too!'

'There is one snag with *EXEC, and that is that a Basic program in memory can become corrupted if there is any data in the file in which a number (ASCII characters 48-57) follows a carriage return (ASCII 13). Basic thinks this is a line number. So any Basic program should be saved first. This is because *EXEC pretends that what it reads has been typed at the keyboard.'

'A better way to re-display a spooled file is to use a short piece of Basic to read in the data and send it directly to the screen. This way, no program can get corrupted:

```
10 X% = OPENIN "filename"
20 REPEAT
30 VDU BGET# X%
40 UNTIL EOF# X%
50 CLOSE# X%
```

'It would of course be a bit quicker in machine code, and more convenient because it could be run from disc by using a star command.'

John provides a machine code version of the Basic above, but in fact most people have this facility already. This is exactly what most versions of *TYPE do on a BBC model B - the *TYPE command is usually available if you have a DFS. On a Master, *TYPE deals with VDU codes differently, but its place has been taken by the *PRINT command.

So if you have *TYPE or *PRINT on your machine, use it instead of *EXEC when replaying spooled graphics files. If you don't, John's program to create a *PRINT command is on the yellow pages. Type in listing 3 and save it. Running the listing will save a machine code file on disc called 'PRINT'. Now to replay a file called 'PIC', just type *PRINT PIC.'

£5 **MASTER RAM BANKS**

Here's a quickie from Adam Gorst from Warrington. It wins him £5. It is a short program to print out which of the Master's RAM banks are switched in and which are switched out.

```
10 A%=&44
20 R%=(USR &FFF4) MOD &1000 D
40 FOR C% = 0 TO 3
50 PRINT "BANK "; C%+4;
50 D% = 2^C%
60 IF (R% AND D%) <> 0 THEN PR
INT " Paged out" ELSE PRINT " Av
ailable"
70 NEXT C%
```

£5 **TESTING THE PRINTER**

If you try to print something, but your printer isn't connected, or isn't switched on, then the micro can 'hang up'. The Caps Lock and Shift Lock lights come on when this happens. It would be useful to have a way of testing to see if the printer is working. That's what listing 4 on the yellow pages does.

It works by testing the micro's printer buffer - the place where it stores characters temporarily before sending them to the printer - with ADVAL(-4). Try to print something with the printer off, and this buffer begins to fill up. When this happens, you will find that Juliet Wilson's program switches off printing.

It tests to see if the printer is connected by finding out how much space there is in the printer buffer, then sending a few null bytes, and seeing if the space in the buffer has decreased. The one-second wait is necessary to give the printer a chance to take the characters from the buffer.

ADFS HEADACHES

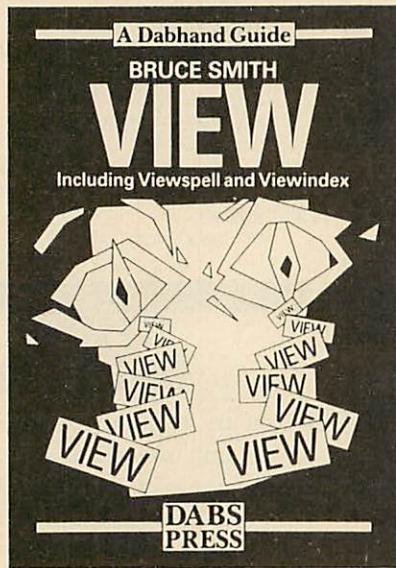
When using the Advanced Disc Filing System that comes as standard on the Master 128 and Compact, there are two error messages that strike at the heart - Broken directory and Bad FS map.

Sometimes it really does mean that your disc is fatally corrupted, and that you have lost all your precious files. But more often than not, the problem can be 'cured' by typing *MOUNT.

VIEW GUIDE

A U O F F E R

Bruce Smith's Dabhand book



Bruce Smith has covered all aspects of wordprocessing in this comprehensive guide to *View*.

The 240-page book covers: Command and Edit mode, Rulers and Margins, Saving and Loading text, Boot files, Markers, Formatting and Justification, Search and Replace, Stored Commands, Page layout, Printer Drivers, Macros, Handling Long Documents, Hints and Tips, *View* Manager, Machine Code utilities, *ViewSpell*, *ViewIndex* and *OverView*, Utility programs, *View* version changes, Quick reference, Printer Control codes and Technical notes. Applicable to the BBC B, B+, Master 128, Compact and Electron.

Please send me:

copies of *View A Dabhand Guide* at £12.95
(including p&p)

copies of book and 5.25-inch disc at £16.95 (£1.00
Discount)

copies of book and 3.5-inch disc at £17.95 (£2.00
Discount)

I enclose a sterling cheque/PO payable to Dabs Press for
£ (outside the UK add £2 p&p)

NAME

ADDRESS

POSTCODE

Send this coupon with your remittance to Dabhand, Acorn User Merchandising, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

PP
s

Premier Software PM
47 Alderford Street, Sible Hedingham, Halstead, Essex CO9 3HX
Tel. 0787 60426. Prestel MBX 219996438 BT Gold MLK 140

PRINTROM

If Your Printer Can Do It

PRINTROM makes it easier to use

Printrom is a menu driven ROM which allows easy access to all of your printers special functions such as underline, condensed print, emphasized print, double width. As well as being able to be available from the menu these functions are available by typing simple star commands. These star commands can be placed inside Wordwise Plus text and also from within *View* and almost every other major word processor. It is not possible to state exactly what each version of Printrom will do because that depends upon which printer you use, but here are some of the commands which are implemented on the Panasonic KXP1080/1 version:

- * Underline <On/Off>
- * Emphasize <On/Off>
- * Condensed <On/Off>
- * Speed <U/B> (Uni or Bi directional print)
- * Centre <On/Off>
- * Proportion <On/Off>
- * Margin <Left> (<Right> + Width)
- * Formfeed
- * Enlq <On/Off>
- * Elite <On/Off>

There are over 30 commands in this version of the ROM so these are just a few examples

Printrom is available for the following printers but if yours is not in this list give us a call and we will see what we can do:

Panasonic KXP 1080/1, Taxan Kaga, Cannon PW1080/1156, Most Epsons, Brother M1009, Centronics GLP, Acorn AP100, NEC Pinwriters, Star SQ10 etc.

ROM version £14.95, S/Ways version £9.95
Prince includes VAT but add a pound for P&P

Works with all versions of the BBC Micro

THE BBC DATABASE M.P.S.S.

"More powerful than D-Base 2"
Tony Crofts, LVL
"Data Breakthrough"
Acorn User.

"Highly recommended"
Micro User.

The most powerful management database on any micro today.
In use for profiling in over 40 Local Authorities.

MBSS costs £100 + VAT
This system has an unbelievable ability to create a Database System for any applications.

We would welcome all enquiries from individuals/agents who are interested in building & selling these systems on a commission basis.

FURTHER DETAILS FROM

Management Data Systems Ltd.,
108 Parthenon Drive,
Liverpool L11 7AQ
Tel: 051-226-1214

FIRST BYTE

THE FIFTH AMENDMENT

Acorn's latest version of Basic for the Archimedes contains new commands to match the power of the machine

Tessie Revivis

We will have a break from machine code this month in the light of the launch of the latest computer to wear the BBC badge – the Archimedes. Last month's issue contained full details of how the micro is put together and of all the new technology it employs – so I thought that this month we could have a look at the new version of Basic supplied with the Archimedes – Basic 5 – and at some of the many new commands which it contains.

Basic 5 is a much enhanced version of the Basic versions 40 and 4 supplied with the Master Compact and Master 128 respectively. The good news is that it is compatible, in that programs written for the Master and BBC micros will run on the Archimedes, provided they are entirely legal and do not try to alter or look for specific memory locations. Programs written on the Archimedes will work on the Master and BBC B micros provided they limit themselves to the Basic commands on those machines – if they use any of the new Archimedes commands then they simply won't work.

Basic control

There are three new sets of Basic control statements to enhance the old REPEAT... UNTIL and IF... THEN... ELSE structures. The first of these we'll look at is an improvement to the latter – the IF... THEN... ELSE... ENDIF structure. Let's first examine the original one with an example program:

```
10 FOR i=0 TO 10
20 IF i<5 THEN PRINT
"Less than five" ELSE PR
INT "Greater than five"
30 NEXT i
```

Line 20 is very long because all the text must be on a single program line. If i is less than five then 'Less than five' will be printed, otherwise it's greater than five and the 'Greater than five' will be printed.

The new command allows these state-

ments to be split over several lines, as shown in the next program:

```
10 FOR i=0 TO 10
20 IF i<5 THEN
30 PRINT "Less than f
ive"
40 REM More lines as
required
50 ELSE
60 PRINT "Greater tha
n five"
70 REM More lines as
required
80 ENDIF
90 NEXT loop
```

Now if i is less than five every line up to the line containing ELSE will be carried out. If i is greater than five, all the lines from the line containing ELSE up until the line containing ENDIF are used instead.

Unlike the original IF... THEN... ELSE, including the THEN part is compulsory. ELSE and ENDIF must also be the first statement on their respective lines.

WHILE... ENDWHILE was unofficially promised for inclusion in the original version of BBC Basic – Basic 1 – but it never appeared. In essence, this is a loop that will continue operating while a particular condition remains true:

```
10 i=0
20 WHILE i<10
30 PRINT "Loop= ";i
40 i=i+1
50 ENDWHILE
```

The loop will continue operating while the value of i remains less than 10.

The WHILE...ENDWHILE loop is virtually the same as the REPEAT... UNTIL loop present in all previous BBC Basics. There is, though, one important difference. In the REPEAT... UNTIL loop, the lines between the REPEAT and UNTIL are done at least once – the condition is tested at the end of the loop. But the WHILE condition is tested each time the loop begins – so if it fails the first time, then the loop is skipped altogether! So

for example, the program below never does line 30:

```
10 a=10 : b=20
20 WHILE a>b
30 VDU 7
40 ENDWHILE
```

The final new control structure looks complicated but is very useful. It is CASE... OF... WHEN... OTHERWISE... ENDCASE. This originates from the Pascal language and allows you to choose one of a number of alternatives:

```
10 REPEAT
20 CASE GET$ OF
30 WHEN "U", "u":PRINT
"Up we go!";
40 WHEN "D", "d":PRINT
"Down we go!";
50 WHEN "L", "l":PRINT
"Off to the left!";
60 WHEN "R", "r":PRINT
"Off to the right!";
70 OTHERWISE PRINT "N
owhere!";
80 ENDCASE
90 UNTIL FALSE
```

In line 20, GET\$ waits for a character to be entered at the keyboard, and this forms the CASE... OF variable. Now that character is compared with each of those in the WHEN statements, and if it is recognised the appropriate string is printed. Two characters are compared in each WHEN statement, but more could have been. The OTHERWISE condition is used if none of the WHENs have been fulfilled, and the whole routine is terminated by the ENDCASE. This is similar to IF... THEN... ELSE structure:

```
10 REPEAT
20 flag=0
30 A$=GET$
40 IF A$="U" OR A$="u"
" THEN PRINT "Up we go!"
;:flag=1
50 REM Rest here
90 IF flag=0 THEN PRI
NT "Nowhere!";
100 UNTIL FALSE
```

Serious BBC Micro users start here...

NEW : Master Emulation ROM

The Master Emulation ROM (MER) emulates all the Master 128 extra commands on a Model B or B+. From power-up the additional '*' commands, *STATUS and *CONFIGURE system, and filing system and FX call extensions are available—in fact it's just like using a Master! If you have sideways or shadow RAM fitted to your machine, the ROM recognises this and fully implements the shadow and sideways RAM commands *SRLOAD/*SRREAD and *SHADOW. The ROM is compatible with most popular sideways and shadow RAM boards including Aries, Watford Electronics, and Solidisk. Every effort has been made to accommodate Master features, and as well as all the '*' commands the ROM provides extensions to OSFSC and OSARGS, OSGBPB with tape, the new ROM service calls, all the 1770 extra filing system calls (*EX, *MAP etc.), and a DFS/ADFS formatter and verifier. Even the @ feature has been added to BASIC. The complete and user-extendable *CONFIGURE system stores data either on disc or in battery-backed sideways RAM during power-down. NB: The MER does not support extended graphics.

The MER costs £19.95 inc VAT and p&p and a comprehensive 48-page manual. It is also supplied on disc for loading into sideways RAM at £14.95. The MER will be available from mid-September, but anyone ordering between now and 30 Sept 87 will receive a free book on assembly language, or a copy of Conversion Kit—specify which when ordering.

Master Operating System: A Dabhand Guide

Master Operating System: A Dabhand Guide by David Atherton is the only advanced user guide for the Master 128, Compact and BBC B+. 272 pages are crammed with a detailed examination of the MOS, with much previously unpublished information on areas such as the Tube, library filing systems, and non-volatile RAM. Areas such as sideways ROM service calls, shadow RAM for data storage, and differences between the various BBC micros are covered in immense and fascinating detail.

A companion disc contains the many example programs in the book, plus extra programs such as a Master total memory editor, and a useful utility ROM image. Book £12.95, Book and disc £17.95.

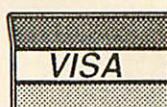
Orders

Send cheques PO or official orders to the address below, or quote your Access/Visa number and expiry date. Access/Visa also accepted by telephone. Dealers and book trade orders welcome. P&P free in the UK. Abroad add £2 (£10 airmail). All discs available in 3.5" ADFS format—£2 extra. All discs are unprotected.



76 Gardner Road • Prestwich • Manchester • M25 7HU • 061 773 2413

DABS PRESS



View: A Dabhand Guide

View: A Dabhand Guide by Bruce Smith is the definitive guide to the VIEW wordprocessor, 248 pages of expert guidance on all features including rulers, saving and loading text, markers, formatting and justification, margins, page layout, macros, printers and printer drivers, and continuous processing. ViewSpell and ViewIndex fully covered.

The companion disc contains many utility programs such as a complete file management system, a page preview utility, and an extended catalogue system, a printer driver generator, and a help system to use in Sideways RAM. Book £12.95 Book and disc £17.95

ViewSheet and ViewStore: A Dabhand Guide

Graham Bell's giant 300-page reference and tutorial guide for these two products, with utilities and examples such as building an invoice system. Lots of troubleshooting advice in clear and friendly style. Examples also available on disc. Available October 1987. Orders accepted now for priority despatch. Book £12.95 Book and disc £17.95

Fingerprint

Fingerprint is a machine code monitor for all versions of the BBC Micro, with powerful single-step trace and execution facilities, full screen memory editing and disassembly for an amazingly low price! 8 breakpoints in RAM or ROM, full support for 65C02 & R65C02 mnemonics, unobtrusive 2-line display, output to screen, printer or RS232. Disc contains normal, sideways RAM, and Tube versions. Supplied with keystrip and 32pp manual. Only £9.95

Assembler Bundle

BBC Micro Assembly Language and Assembler Workshop both by Bruce Smith are superb books for anyone learning machine code programming. Get both these books plus their companion discs containing a total of 90 programs, and an update booklet specially written for Master users for a small fraction of the original £30 asking price—only £9.95 inclusive.

Conversion Kit

This collection of 26 assembly language routines by Bruce Smith takes the pain out of programming by providing all those tricky routines such as decimal to binary, hex to ASCII and so on. Disc also includes ROM image. Detailed manual. £7.95

CASE is somewhat more elegant to use and gives the program a more structured feel, without the need for long lines of Basic and extra flag variables.

Graphics

The Archimedes has a staggering 21 screen modes, 18 of which can be displayed on a standard monitor. The other three need an expensive special monitor. A number of new graphics commands have been added to make complex graphics work easier, including LINE, RECTANGLE and CIRCLE.

LINE is the MOVE and DRAW commands combined, into one. For example:

```
10 MOVE 50,50
20 DRAW 900,950
```

can now be written as:

```
10 LINE 50,50,900,950
```

The RECTANGLE command takes just four values – the first two define the bottom left-hand corner of the rectangle, the next two define its height and width – not, note, its co-ordinates.

```
10 RECTANGLE 200,300,
400,100
```

This would plot a rectangle 400 points across and 100 points high, starting from the co-ordinates 200,300. By adding FILL after RECTANGLE it is also possible to fill in the rectangle in the current drawing colour, for example:

```
10 RECTANGLE FILL 200
,300,400,100
```

The CIRCLE and CIRCLE FILL commands work in much the same way, but only three values are required. These define where the centre of the circle is to be, and the radius of the circle, like this:

```
10 CIRCLE 300,300,100
20 CIRCLE FILL 600,60
0,200
```

While no special names are given to them, PLOT commands make it possible for you to draw parallelograms, ellipses, arcs, segments and sectors with ease, just as they do with the versions of Basic used on the Master series micros.

The FILL command may be used by itself to fill any area with the current drawing colour. All you do is specify the co-ordinates which you require the fill to start at, like this:

```
FILL 300,300
```

The fill continues until it reaches a boundary, such as the line surrounding a box.

A command called BY can be added to MOVE, DRAW and POINT to make the equivalent of a PLOT 1 command. The two co-ordinates that follow the BY command are relative co-ordinates. This means that they are not actual screen positions, but are measured from the current position.

```
10 MOVE 200,200
20 POINT BY 100,100
```

would plot a point at a position 100 points up and 100 across from the cursor position set by the MOVE command, that is at an actual screen position of 300,300.

It is also now possible to set the graphics origin of the screen using the ORIGIN command. Ordinarily the origin of the screen, which always has the co-ordinates 0,0, is at the bottom left-hand corner. It could be set to the very centre of the screen with the command ORIGIN 640,512. The following program draws a circle:

```
10 ORIGIN 640,512
20 CIRCLE 0,0,200
```

You can change the origin of the screen as many times as you like without affecting what you have already drawn. ORIGIN is exactly equivalent to the VDU 29 command in the current versions of Basic.

A number of new commands exist to make general programming easier. For example, it has always been a tedious task to add one program to another. This has always involved you having to *SPOOL the second file out to disc or tape, load the original one in, and then *EXEC the second file onto the end of it. At long last there is an APPEND command. You simply specify a filename and that file will be added on to the end of the program which is already loaded so:

```
LOAD "Program1"
APPEND "Program2"
```

joins together programs 1 and 2. The appended program is then renumbered so that it follows on from the first program.

We have covered the process of debugging programs in past instalments of First Byte – and we've seen how useful a list of all the variables used by the program, and the values they hold, can be. The Archimedes has such a command – LVAR. In addition to listing the variables, it will also list all of the function and procedure names which have been used in the program.

Returning values

As many of you will know, it is only possible to pass one value back from a function, and none at all from a procedure. Basic 5, however, allows you to specify RETURN parameters in the function or procedure heading. So, for example:

```
10 n = 10
20 PRINT n
30 PROCprint (n)
40 PRINT n
50 REM other lines
100 DEF PROCprint (RET
URN a)
110 a = 20
120 PRINT a
130 ENDPROC
```

will print the numbers 10, 20 and 20. 'n' is given the value of 10 and then passed to PROCprint in 'a'. 'a' is then given the value of 20 which is passed back into 'n' when the ENDPROC is executed.

This may just appear to be a substitute for using functions, but it is now possible to return more than one numeric or string variable, or indeed a combination of both.

Machine code

Over the past months we have been writing many machine code programs. As you are probably aware, the Archimedes has a different microprocessor to that used on the BBC B, B+ and Master series, Acorn's own RISC chip instead of the 6502 chip. And, of course, Basic 5 has a RISC assembler for the new chip. But it can run 6502 machine code programs! How? Simply load in and then run a special program called an emulator module which is supplied on the Welcome disc. This will then emulate the 6502 microprocessor so that 6502 machine code programs act as though they were running on their own processor.

The emulation doesn't stop there – you can even write new 6502 programs using the emulator's own Basic.

And finally

If you do plan to invest in an Archimedes and are worried about the new commands – don't be. There's even a HELP command which will give you guidance on any command you care to name!

We have only touched on some of the more important of the new facilities from the point of view of a Basic programmer. They all help to make BBC Basic 5 one of the best versions of Basic around today – certainly it is the fastest.

BOX OF TREASURES

A 55 MINUTE AUDIO TAPE - two professionally-produced stories and a play on the theme of 'boxes'. SIX BOOKLETS - lots of useful info., poems, examples, a wealth of ideas to last for many weeks. HELP CARDS - for each program, blank labels for data discs, other items. BOX OF TREASURES - can be used as the core for a lengthy project on the theme of 'boxes' or the individual items may be used independently for all manner of curriculum-related activities. FIVE PROGRAMS ON TWO DISCS: (Epson Dumps Provided). 1. THE BOX OF TREASURES - an exciting adventure. 2. CREATE - a word-processor with a difference - write a story then add animated pictures easily. 3. BLANK - a 'form processor' for designing record sheets, coupons, blank forms etc. 4. BOX DRAW - graphics design made easy - draw a picture, edit it, change the scale. 5. MAKE-A-BOX - a starting point for stories and discussions.

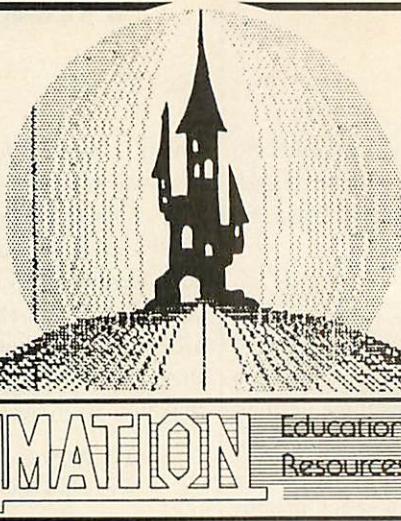
DRAGON WORLD

The package includes an audio tape of the exciting story and original music for dance/drama, a two-part adventure, four supplementary programs including a music synthesizer, an illustrated story book, a comprehensive User's Manual, Concept keyboard overlay, illustrated record sheets and a Book of Ideas containing 100+ suggestions for class activities.

FLOWERS OF CRYSTAL

Two part adventure, introductory dramatised audio story, work sheet, utility, map, superbly-illustrated booklet teacher's manual.

Prices include P & P. Add VAT on all items.



TELE-BOOK

An extremely flexible menu-driven program which allows 'books' of up to 15 pages of text and graphics to be created.

4MATION Educational Resources

'LINDEN LEA', ROCK PARK, BARNSTAPLE, DEVON EX32 9AQ TEL: (0271) 45566

	BBC Disc	BBC Cassette	Spectrum Cassette	RML Disc
Zoopak	£21.00	N/A	N/A	N/A
Dinosaur Discovery	£16.00	N/A	N/A	N/A
Box Of Treasures	£23.00	N/A	N/A	N/A
Dragon World	£17.65	£16.00	N/A	£17.65
Flowers of Crystal	£17.65	£16.00	N/A	£17.65
Tele-Book	£17.65	£15.00	N/A	N/A
Granny's Garden	£12.00	£10.00	£10.00	£12.00
Spacex	£10.40	£ 8.65	£ 8.65	N/A

MULTIPROM EPROM PROGRAMMER



MULTIPROM allows the experienced user to program 2764, 27128, 27256, 27512, 27513 and 27011 EPROMs, including "A" version. Programming of 27256 up types is carried out in 16K blocks to ensure MULTIPROM compatibility with all models of BBC from B to Master. The UVP 1.1 software requires DFS and a disc drive for operation.

The fully cased MULTIPROM plugs into the user port on the BBC microcomputer, taking power directly from the computer, with an onboard converter providing the programming voltage. Two switches with LEDs are provided, one powering down the MULTIPROM to insert or remove an EPROM from the Textool ZIF socket, and one for Vpp on/off. DIP switches enable swift configuration of the MULTIPROM for each type of EPROM. The necessary UVP 1.1 software, which includes fast programming algorithm, is available on Sideways ROM and contains the following commands: - *TEST (blank check), *READ (afsp) (read EPROM to disc), *BLOW (afsp) (blow EPROM with names file), *VIEW (look at contents of memory from &2000), *COMP (afsp) (compare contents of EPROM to disc). When using *VIEW & *COMP, data is displayed in hex and ASCII format.

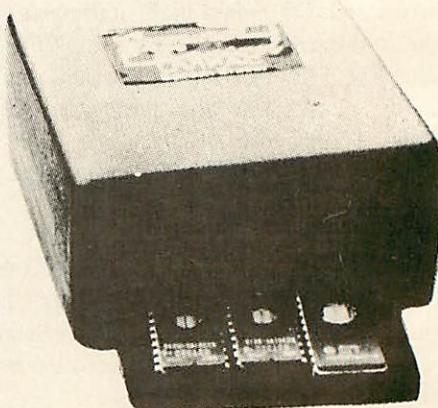
Prices: MULTIPROM UVP 1.1 ROM
£44.95 £5.00

UVIPAC EPROM ERASER

The UVIPAC was designed especially for the home microcomputer enthusiast, but is equally useful in the development lab when quick erasure of just a couple of EPROMs is required.

A special type of discharge tube is used to help achieve the very compact dimensions of the unit, which is housed in a 90 x 80 x 40 mm plastic case. The 230 or 110 volt (+ or -5%) mains powered unit enables up to 3 EPROMs of any size, or 1 CPU with on-board EPROM to be erased in around 15 minutes usually.

The EPROMs are simply loaded into the conductive foam pad supplied and inserted into the unit. After the door has been closed the unit is switched on, an optical fibre indicator showing positively that the unit is in operation. When the required period has elapsed the unit is switched off and the EPROMs removed. The UVIPAC can also be supplied with a built in fixed 15 minute timer, the UVIPAC (T), or with timer and audible time out sounder, the UVIPAC (TS). Spare tubes and conductive foam pads are available if required.



Prices
UVIPAC £21.45
UVIPAC (T) £26.45
UVIPAC (TS) £28.45

MULTIPROM + UVIPAC (T) SPECIAL OFFER!!!

Buy a MULTIPROM, a UVP 1.1 ROM and UVIPAC (T) for only £70.00, a saving of £6.40 over the regular price. This offer lasts until Dec 31st 1987. In stock for immediate delivery on receipt of your order.

Type 1-2 3-9 10 up
EPROMS 27C128-25 £3.50 £2.90 £2.60
27256-25 £5.00 £4.90 £4.60

Both type require 12.5 Volts Vpp
S.A.E. for details of Uviprom conversion 21 Volts to 12.5
Volts datasheet

Ground Control

Send orders to:
Dept. AU
Ground Control
Alfreda Avenue
Hullbridge
Essex SS5 6LT
TEL: 0702 230824

ALL PRICES INCLUDE
VAT AND P & P.
MAIL/TELEPHONE
ORDERS ONLY PLEASE.
DETAILED DATA ON
REQUEST



ACORN FORUM

David Atherton discovers readers' ways of working without line numbers, and simulating Basic @ and the code key system

£10 INITIALISING ROM IMAGES

Quentin Stafford-Fraser from Ware keeps his ROMs on disc as 'images'. He's spotted the 'I' suffix on the Master Compact, which is not available on earlier machines. Quentin has written listing 1 on the yellow pages, which initialises any ROM images loaded into sideways RAM. They can be used straight away, without pressing CTRL-Break. Although written for the Master and B+, it should work with most model B sideways RAM too.

The program works by scanning each ROM slot, using Osrdrm (read a byte from paged ROM), and copying the type byte at &8006 into the ROM table which is usually at &2A1 – this address is read by Osbyte 170. Any slot that does not contain a ROM must have a table entry of zero, so the program also checks that the data is valid ROM data by reading the 'C' of the copyright symbol, which is found at (&8002+?&8007). If a 'C' is not found, the type byte is not transferred. The net effect is to install any new ROMs loaded.

To finish, service call &27 is issued. On the Master series, this is used to inform the ROMs of a reset, so they claim any work space they need. On the model B or B+ this has no effect. The program shouldn't be used on a B or B+ for ROMs which claim work space, such as filing systems.

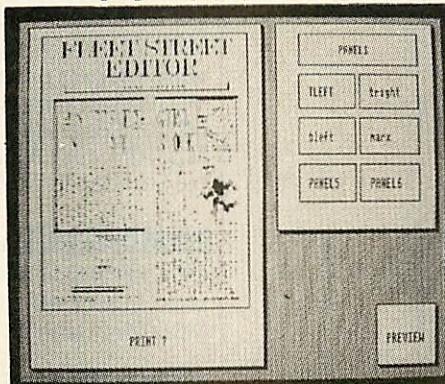
Listing 1 creates a machine code file called 'ROMINIT'. You should load your ROM using *SRLOAD, or use the utility provided with the sideways RAM – *RLOAD if you have UserRAM. Then type *ROMINIT. Keep the program on the same disc as your ROM images.

£5 FLEET STREET EDITOR TIP

Forum regular Jonathan Temple says that the Graphics Studio section of *Fleet Street Editor* is a formidable piece of software, and it gives access to the fonts and clip art library too. However, it can't normally be used as a general purpose art utility – the graphics cannot be loaded into other graphics packages. To remedy this,

Jonathan has worked out how the *Fleet Street* graphics files are stored and has produced a decoder program.

When preparing graphics in the Studio,



Fleet Street graphics

make the frame around them as large as possible without an 'area off panel' error. The frame should enclose almost all the drawing panel. Then save your efforts. Go back to Basic, and run the decoder program, listing 2 on the yellow pages. Enter the name of the graphics file, and the *Fleet Street* screen will be loaded. You can now *SAVE the screen to disc as usual:

*SAVE <name> 5800 7FFF

This mode 4 screen can then be treated like any other.

£10 CODE KEY SIMULATOR

Ian Goldby from Broxbourne has sent me an interesting program which offers to model B and Master 128 owners the 'code key' systems found on the Compact. The code key allows you to type all 256 ASCII codes from the keyboard, instead of just the first 127 as is normally the case. There is an extra key on the Compact keyboard where the @ key is found on the earlier machines – marked with two squares. If you press CTRL-Shift and the code key, nothing happens! But the next letter typed has 128 added to its value. So to get the character 130, to generate a green text code in mode 7, a Compact user would use the combination CTRL-Shift-Code, then release all keys, then type CTRL-B. This last keypress normally generates ASCII 2, so the result is 2+128 or 130.

The feature is not just for generating

mode 7 codes. Some text editors (*Edit* for example) allow the entry of codes above 127, and it is useful in many communications programs, which need eight-bit code sent to the remote computer.

Ian's program works by defining the Tab key to work as a code key. When you run the program, the Rdchv vector is redirected to point to Ian's code – that means that every time the operating system waits for a key press, Ian's routine can see what it is. If it's a Tab, a flag is set at 'char'. All other codes EOR themselves with the flag – &80 signifies the flag is set, and so codes are automatically altered when the flag is set but not when it's clear. Listing 3 on the yellow pages generates a machine code file 'TABCODE'. *RUN this to generate code 130, press Tab and then CTRL-B.

Unlike the Compact, the addition of 128 remains in force for every character typed until you press Tab again. When the routine is active, the cassette motor light comes on on a model B. Master users will have to rely on the audible click from the motor relay.

£10 SIMULATING BASIC @

Basic 4 on the Master Series can be started by using *BASIC @. The @ makes Basic take text in memory and convert it to a tokenised Basic program. The main use for *BASIC @ is to allow Basic and *Edit* (the Master text editor) to work together, but it could also be used by other utilities.

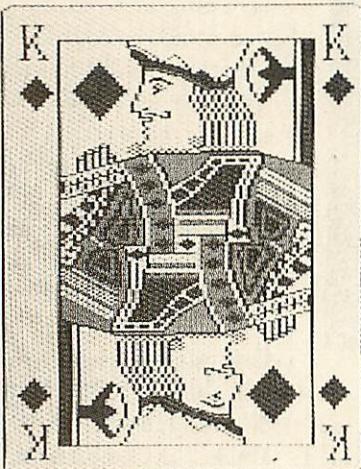
David Spencer's program, listing 4, provides *BASIC @ for BBC Basic versions 1, 2 and 3. The program is slightly different from the Master version, and the memory address of the text should be added after the '@'. If no address is given, the text is read from the address pointed to by locations &00 and &01 in zero page.

The way the routine works is by interception of Osword 0, the routine used to input lines of text. Basic uses this call to allow you to type in programs, and David re-directs the call to point to his own routine. This ignores the keyboard and reads in text from memory. Basic thinks this is text being typed, and turns it into a program. The screen is disabled, so you

SUBSCRIPTION

A U O F F E R

Two free issues of Acorn User



Acorn User gives you more for your money – every month you get up-to-the-minute news, informative features, product reviews, useful programs and a range of hints and tips for all the BBC and Acorn micros – more than you get from any other user magazine.

And by subscribing today you will receive even more – two full issues absolutely free! We will send you 14 issues for the price of 12. Guarantee the delivery of your *Acorn User* magazine now and enjoy the best editorial, news, comment and programs.

Acorn User is the only way to ensure that you are kept up to date with the ever changing world of the BBC/Acorn micro, so have it delivered direct to your home.

This offer is only open to UK readers, our overseas readers should turn to page 122.

YES! Please start my subscription for 14 issues of *Acorn User* with the _____ issue.

NAME _____

ADDRESS _____

POSTCODE _____

I enclose my cheque/postal order made payable to Redwood Publishing Ltd for £17.50.

Please debit my Access/Barclaycard/American Express

ACCOUNT NO: _____

EXPIRY DATE: _____

SIGNED _____ DATE _____

Send this coupon with your remittance in an envelope to Gail Fairhall, Subscriptions Manager, Redwood Publishing Limited, Lambourn Woodlands, Newbury, Berkshire RG16 7TW.

SPECIAL OFFER
NASHUA
Diskettes
£7.65 Per
Box 10

CENTRAL LONDON COMPUTERS

BBC MASTER SERIES

AMB15 Master	£349.00
ADB12 Master ET	£312.00
ADC06 Master Turbo Upgrade	£97.50
ADC08 512k Upgrade	£189.00

UFD DISK DRIVES

with no power supply	
MD400A 40/80 Track Switchable	£112.50
MD802C Dual 40/80 Track Switchable	£197.00

with integral power supply	
MD400B single 400k, 40/80 Track Switchable	£127.00
MD802E dual 800k, 40/80 Track Switchable	£227.00
MD802M dual 800k, horizontally mounted in monitor stand, 40/80 Track switchable	£247.00

3.5" DRIVES WITHOUT POWER SUPPLY

MD400F single 400k, in dual case with blanking plate, to allow easy upgrade	£79.00
MD802F Dual 800k drive version of above	£169.00

3.5" DRIVES WITH POWER SUPPLY

MD400G As MD400F but with psu	£113.00
MD802G Ad MD802F but with psu	£185.00

3.5" & 5.25" DRIVE COMBINATIONS

COMBO(E) 5.25" 40/80 Track 400k + 3.5"	£225.00
400k with psu	

COMBO(C) As above but no psu

FD BOXED HARD DISKS FOR BBC AND MASTER SERIES

HD2000 20Mb hard disk in BM802E case with psu, control cards & BBC host adaptor	£499.00
HD4000 As above but with 40Mb hard disk	£799.00

MONITORS

BM7502 Philips High Res. Mon Screen	£69.00
Philips 8833	£229.00
1451MS Microwitec Med. Res. colour	£225.00

ARCHIMEDES

CALL FOR PRICE

FULL RANGE OF MONITORS PLEASE PHONE

PRINTERS

Star NL-10 Parallel	£226.00
Star NX-15 Parallel	£295.00
Star NR 15 9 pin 240 cps 132 col	£479.00
Star NB 24-10 pin 216 cps 80 col	£486.00
Star NB 24-15 pin 216 cps 132 col	£616.00

FULL RANGE OF PRINTERS PLEASE PHONE

CENTRAL LONDON COMPUTERS

01-323 2840

37 Store Street, London WC1

All prices are exclusive of VAT. Visa and Access accepted. Prices exclusive of postage and packing. Prices subject to change with out notice. All goods subject to availability.

We also supply a full range of IBM compatibles and Amstrad

BARCLAYCARD
VISA

ACORN

don't see anything. When the routine finds 256 characters without a carriage return, it assumes it has found all the program text.

David has made the program Tube-compatible. If it detects an active 6502 second processor, some code is actually copied across the Tube and run from the second processor, as this is where the ASCII text will be.

Running the listing will generate a file called 'BASIC'. Place your text file in a known area of memory, and type:

```
*/BASIC @<addr>
```

where `<addr>` is the start of the text. *View*, for example, stores text from `OSHWM+&100`, so on a standard disc-based model B, you can type in a program using *View*, then type `*/BASIC @1A00`, and the program will be automatically transferred into Basic.

RESTORE YOUR SCREEN

It is not generally known that monitor screens have a limited life. After some time, perhaps a couple of years of hard use, you might find that some marks begin to appear on the screen, literally burnt in to the coating on the back of the glass. This happens because the monitor is often left showing the same, unchanging picture. It doesn't happen to televisions to the same extent, because they display a moving picture most of the time.

The process is accelerated by keeping the brightness up too high, and particularly by leaving the monitor and computer on while they aren't being used. But you may not want to switch off the equipment – electronic devices are less reliable if they are switched on and off too frequently.

David Acton has devised a short utility to blank the screen when you leave the micro doing nothing, in order to prevent this type of screen marking. It works by waiting for you to press keys. If you do, nothing happens. But if no key is pressed for five minutes, then the screen is blanked. Don't worry, the display is restored as soon as a key is pressed.

Type in listing 5 on the yellow pages, save it in a file called 'Autosrc', and run it. If you have typed it in correctly, then it saves a machine code file called 'Autooff'. If you have made a mistake typing in the assembly language, then the program ends with the message 'Assembler error', so

check the listing. Once it is all working, and you have saved the 'Autooff' file, type `*AUTOOFF`, then go away. The screen is blanked automatically if you don't touch the keys for a few minutes, leaving only the flashing cursor. And when you come back and type anything, the screen display reappears immediately. The program keeps on working until you press Break or switch the whole computer off.

'Autooff' uses memory at `&A00`, which is normally used when loading files from cassette. If you use cassettes, then it is best to use a different version of 'Autooff'. Type in the listing, then change the `A00` in lines 80 and 120 to `C00`, and change line 1370 to:

```
IF J%=&4D27 THEN =TRUE
```

Now run the new version, and a different 'Autooff' file will be created. This uses memory at `&C00` instead.

You will have to type `*RUN AUTO-OFF` to use the utility from tape, and it won't work together with any other program that changes the user-defined characters with `VDU23` commands.

MASTER EDIT TIP

I often write Basic programs on my Master 128 using *Edit*, and I find that having line numbers in the listing is messy. I keep having to leave *Edit* to renumber the program. A better way by far is to work without line numbers at all. You can add them back when you return to Basic. This is very easy – start with your Basic program, then type `EDIT` to put it into the editor. Leave the cursor at the top of the screen and type a single carriage return. Then press `f5` for global replace, and type:

```
...../
```

at the prompt. This means replace 'carriage return and the next five characters' with just 'carriage return'. As the first five characters of each line are spaces or line numbers, this action neatly strips them all out leaving just the program text.

To put the line numbers back when you have finished, go to the top of the program and insert the word `AUTO` on a line of its own. Don't exit to Basic – instead save the file with `f3`, and type `f1` then `*BASIC`. The `AUTO` command will supply the line numbers when the program is loaded.

A further tip connected to this concerns the stripping of leading spaces between line

numbers and program text. The quickest way to get rid of these, especially on a long program, is to convert the program to an ASCII *Edit* save, then by using `f3` as above. Go back to Basic, set `LISTO 1`, and then `*EXEC` the program back in. Reset `LISTO 0` and `LIST` the program, and you'll find no spaces between line numbers and text. When `LISTO` is set to anything except zero, any spaces at the beginning of a program line are ignored.

Now type `NEW`, then `*EXEC` the program back in – if the text file saved from *Edit* was called 'Txtfile', then:

```
*EXEC Txtfile
```

You can also include comments in the file which don't appear in the Basic program. Put them above `AUTO` and start each comment line with `*`.

£5

TIME STAMPING TIP

Bill Vaughan has a simple tip for Master 128 owners. Inserting the following line into your programs:

```
10 OSCLI "TITLE "+MID$(TIME$, 5, 2)+MID$(TIME$, 8, 3)+MID$(TIME$, 14, 2)+MID$(TIME$, 16, 3)+MID$(TIME$, 20, 2)
```

will `*TITLE` the disc with the current time and date every time the program is run. Bill finds that he is often strangely unable to remember filenames, but can recall the time and date he last used a program. Cataloguing his discs shows when they were last used. This tip works for both DFS and ADFS discs. You won't, of course, need it on the Archimedes, as the new ADFS time-stamps files anyway.

That's all for this month. Keep those tips coming in – but please glance through the last few issues if you have them to make sure we haven't covered the item before. Also keep them short – if a listing won't fit on one sheet of paper in Basic or two sheets for assembler, then it's probably too long. With the Archimedes, we'll have to start slowly – it's going to be a while before there is a large audience. What would be nice is if there are any neat features of the Archimedes which could be implemented on the model B or Master without too much trouble.

See page 113 for further details of the Acorn Forum listings. Send your tips to *Acorn User*, Redwood Publishing, 141-3 Drury Lane, London W2B 5TF.

Advanced Computer Products

THE ADVANCED PLUS FOUR

The Advanced Plus Four (A.P.4.)

- A FULLY ACORN COMPATIBLE disc I/face for the 'ELK' & Plus 1
- Accepts any standard 5 1/4" or 3 1/2" disc drive with PSU
- Supplied with 1770 DFS (as supplied on the B+ & Master series) (A.E.D. is still available for Plus 3 users at £24.15 inc.)
- Page stays at &EO0, the same at Tape F.S. NO LOSS of RAM
- Will allow more tape software to be run from disc
- Access compatible BBC disc-based software. No conversion program needed
- Extra sideways ROM socket fitted as standard
- A self-contained, well finished and fully tested product
- No 'short cuts' in design, finish or components
- ROM software includes format, verify, free space and utils.
- Achieve greater BBC compatibility

£69.55 (+VAT)

"I can recommend it to anyone contemplating upgrading to disc".

Electron User, June '86

"The AP4 should be considered the standard interface for the Electron".

Acorn User, July '86

AP4 SPECIAL PACKAGE PRICES

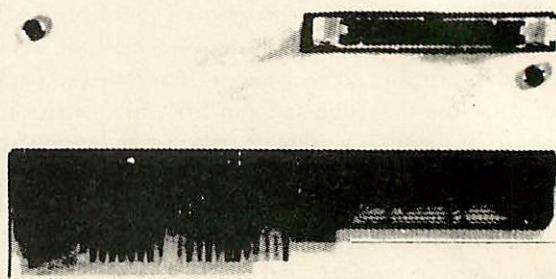
AP4 100 = AP4 + 5 1/4" 40 track S/S including PSU

£199.00

AP4 400 = AP4 + 5 1/4" track switchable D/S including PSU

£229.00

These prices include VAT and delivery



AMX POINTS THE WAY FOR THE ELECTRON USER

AMX MOUSE

Catch an incredible AMX MOUSE! The advanced opto-mechanical device that brings to your ELECTRON facilities once only available on more expensive computers. Now you can use ICONS, WINDOWS, AND POINTERS in your own programs.

AMX PACKAGE

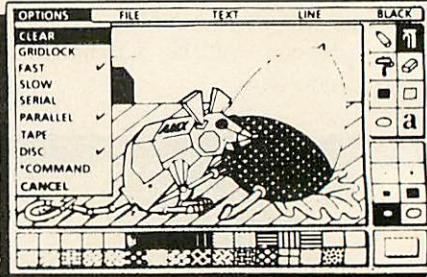
Plug the MOUSE into the user port, and the EPROM into your A.P.5. The latter contains fast machine code routines for creating on-screen windows, icons and pointers. And means that the MOUSE buttons can be programmed for use with commercial software such as Wordwise and View. There are two manuals included, explaining how to operate the MOUSE and the ROM routines, which are available in both basic and machine code programs.

Included in the package are two superb programs

AMX ART has to be seen to be believed! It's a computer-aided drawing program that's just as good for serious applications - such as the preparation of detailed architectural and engineering drawings or teachers' worksheets - as it is for having lots of family fun! And if you're artistically inclined, you'll be astonished at the quality of work you can produce and save. It makes full use of on-screen menus, pull-down menus and icons: the ideal, easy way for novices to learn and gain in confidence.

ICON DESIGNER is an invaluable program for creating and storing icons for use in your OWN programs

The ACP/AMX mouse package may be used on an ELECTRON fitted with a PLUS I & AP5. The 'ART' software is supplied on cassette but can be transferred to DISC (DFS not ADFS)



£69.95 - MOUSE PACKAGE AND AP5 £125.00

PRES

The company responsible for marketing and distribution of Advanced Computer Products.

ANNOUNCE ADVANCED PLUS 3

A magic breakthrough in the price of disc upgrade for electron users. AP3 provides an Acorn standard 1770 interface which plugs into the Plus one providing Acorn's ADFS 3.5" disc drive and spare ROM socket. (This unit may also be upgraded to an AP4 - please contact ACP for details).

Outstanding value at only £99.00 (+ VAT).

INTRODUCTORY OFFER DISC VERSION OF SNAPPER, DRAUGHT AND REVERS; INCLUDED

All orders will be dealt with in strict rotation, cheques and credit cards to Pres Ltd., will only be cashed on despatch. Shipping on AP3 should commence end of September.

**PRES LTD, 6 AVA HOUSE, CHOBHAM, SURREY.
GU24 8LZ**

Advanced Computer Products Ltd., 6 Ava House, High Street, Chobham, Surrey. GU24 8LZ Tel: 0276 76545
THIS IS WHAT ELECTRON USER SAID ABOUT A.P.5:-

"Looking at the A.P.5. shows it to be constructed to a high standard, it looks solid and robust. The A.P.5. Interface opens up the new Electron for a whole new type of computing." E.U. Dec '86

NEW PRODUCT

Advanced Battery-backed RAM for Master and Electron users. A battery-backed 32K RAM cartridge A.B.R. is a self-contained cartridge containing two 16k pages of sideways RAM with a rechargeable battery back up. Each 16k page can be individually locked by software. Supplied with full software support, to include loading software, ROM save, advanced print buffer and a disc utility MAKEROM.
(08/M/E H) - £39.99
"It's a superb Addon and a must for all serious Electron Users" EU June

Advanced Computer Products

ADVANCED DISC TOOLKIT**(01) /M/B/E/C £34.50**

Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd. & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc.: powerful memory & disc editor, search memory/disc/basic, catalogue/unplug ROMS, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc. ("it's superb" ... Database Pubs. - "A top-class toolkit - I have no hesitation in recommending it ... Acorn User Nov. 86) (16K EPROM & FULL MANUAL)

ADVANCED ELECTRON DFS**(05) /E £24.15**

Electron & Plus 3 users gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software A.C.P. also supplies 5 1/4" disc drives to add to your Plus 3 (inc. 2nd drive adaptor) "ACP has produced another superb ROM for the Electron" Electron User Feb '86
(supplied on 16K EPROM + DFS MANUAL)

ADVANCED PLUS 4**(08) /E +1/ £79.98**

DISC DRIVE COMPATIBILITY AT LONG LAST (Electron User June '86) this sums up AP4 & ACP's approach to producing products AP4 is a fully ACORN compatible disc interface & will accept any standard drive inc. PSU, runs 1770 DFS (as fitted in the B+ & Master), keeps page & EOF utils in ROM & provides a spare rom socket ACP's PLUS 4 comes out on top, I can recommend it to anyone! (EU June '86)

AP4 should be considered the standard interface for the Electron (AU July '86)
AP4 100 £199.00 (inc VAT & Securicor delivery)
AP4 400 £299.00 (inc VAT & Securicor delivery)

ADVANCED ELECTRON DFS E&S**(14) /E+ASR/ £19.99**

An alternative to our AED(05) for Plus 3 and ASR users. This optional alternative DFS is designed for use in Sideways RAM (ASR) and allows the user to operate a disc filing system & E&S when using the Plus 3 (in ADFS page would normally be &1D00). The DFS is simply loaded using the software supplied with the ASR from disc. (optional upgrade for existing AED users £9.50 on return of original EPROM) (3 1/2" ADFS disc + manual)

ADVANCED ROM ADAPTOR 2**(03) /M/E+1/ £14.95**

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8K or 16K EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use - no switching - complies fully to the Acorn (sideways) Rom Filing System. A.R.A.2 contains 2 sockets. A single adaptor is also available.

A.R.A.1 (02) /E/ £10.35 "The best ROM cartridge is by far the ACP ARA 2" ... A+B Dec 86

ADVANCED DISC INVESTIGATOR**(06) /M/B/E/C £28.75**

A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40track discs to 80track discs, verify two non-standard discs.

("ADI features an extremely comprehensive sector editor, and one of the finest I've seen" Tubelink on Prestel)

(supplied on 16K EPROM + manual)

ADVANCED PLUS 5**(09) /E +1/ £66.70**

A triple interface cartridge providing:
1) a TUBE I/Face allowing a second processor to be connected, increasing BOTH speed & memory (PAGE & 8000 HIMEM & 8000 in all modes)
2) a 1 MHz BUS for control applications & prommers
3) the USER PORT for mouse and graphic devices.
Also contains 2/3 ROM sockets and on board operating software for 2nd processor

ADVANCED CONTROL PANEL**(20) /M/B/E/C £34.50**

ACP is a front end control panel language providing a sophisticated yet friendly interface between user and computer for access to Languages, MOSS functions and the users own file utility etc. Main features include pull down windows, simple to change MOSS configure, floating point calculator, file manager, SW ROM's facilities, (16K EPROM & FULL MANUAL)

ADVANCED SIDEWAYS RAM**(04) /E+1/ £29.90**

A highly versatile but simple to use s/w RAM cartridge that is automatically write protected on loading. Contains 16K RAM but can be switched (externally) to 2X8K RAM. Supplied with instructions & full software support (on cassette) to save ROM images to disc/tape, load RAM from file, Advanced Print Buffer & MakeRom a utility to merge several files from disc to be run from the ROM FS (S/Ware on disc please add ... £1 5 1/4 DFS £2 3 1/2 ADFS)

ADVANCED ROM MANAGER**(07) /M/B/E/C £14.95**

A friendly utility for ROM & sideways RAM. Examine ROM/RAMs, load files into RAM, move memory to/from SWays ROM/RAM, catalogue/kill ROMS, offer commands to specific ROMS, save ROMs to disc/tape, AUTOROM a file (inc. BASIC) to run from SWays ROM/RAM, execute specific machine code subroutine in a ROM, generate a ROM's checksum & CRC. "Represents amazing value for money. Go out and buy this real bargain" ... Dec 86 Database Publications. (supplied on EPROM + manual)

ADVANCED 1770 DFS**3 versions ADM/C(11) - ADB(12)****ADE (13) £34.50**

ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is probably the fastest & most powerful disc filing system your computer could have. With the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and SWays RAM can be used as a fast RAM DISC
(16K EPROM + comprehensive manual)

NEW EXCLUSIVE PRODUCT ELECTRON ASSEMBLY LANGUAGE

Book by Bruce Smith £2.95 (144)

Software for above book on 3.5" A.D.F.S £3.50 (145) or 5.25" D.F.S. £2.50 (146)

OTHER PRODUCTS & SPECIAL OFFERS

VIEW cartridge	(101) /E +1/ £ 14.95	3 1/2" discs in 1/box	(120) /M/B/E/ £24.00
Vsheet "	(102) /E +1/ £ 14.95	5 1/4" discs ds/dd"	(121) /M/B/E/ £12.99
VIEW & SHEET	(119) /E +1/ £ 22.00	5 1/4 discs ss/sd	(122) /M/B/E/ £ 8.99
LISP cartridge	(103) /E +1/ £ 9.99	3 1/2" disc drives	£129.00
E/Adv User Guide	(104) /E/ £ 3.95	5 1/4" disc drives	£149.00
LOGO cartridge	(106) /E/ £ 29.95	2nd Drive Adaptor	(130) /E +3/ £ 7.95
PASCAL cartridge	(107) /E/ £ 29.95	Compact 2nd Drive Adaptor	(144) /C/ £14.95
VIEW pack BBC	(118) /B/ £ 49.00	3 1/2" library box 10	(124) £ 2.95
AP4 100	(140) /E +1/ £199.00	16K EPROMS	(131) £ 3.75
AP4 400	(141) /E +1/ £229.00	VIEWSTORE	(117) /M/B/(e) £57.95
AP5 + MOUSE Pckage	(143) /E +1/ £125.00	VIEWPLOT	(142) /M/B/ £26.95
		ACORN 1770 upgrade	£48.95

Equipment codes /M/ = Master /B/ = BBC /E/ = Electron /E +1/ = Electron + Plus 1 /C/ = Compact

PROD NO PRODUCT QTY @ TOTAL

Please send order to
Advanced Computer Products Ltd.
6 Avis House, High Street,
CHOBHAM, Surrey, England
GU24 8LZ Tel 0276 76545
(mail order only)
All our prices include
UK delivery & VAT

NAME

ADDRESS

POSTCODE

TEL.

CREDIT CARD No.

(In event of any query
please include your tel. no.)

I enclose payment for £...
Exp date ... (A29)



Electronequip

LEADS SUPPLIED WITH EVERYTHING

Computers & Accessories:

Master 128	435.91
Turbo Co-processor	119.46
512 Co-processor	217.41
Universal Co-processor	79.95
Master Compact (UHF)	343.85
Master Compact (Mono)	425.95
Compact Companion	39.95
Master ROM Cartridges	14.95
Compact TV Adaptor	29.95

Monitors:

Colour:	
Philips 8833 Med Res BBC/IBM compatible	287.50
Microvitec 1451 Med Res BBC RGB TTL	249.95
Mono: Zenith ZVM1230 (Green) and ZVM1220 (Amber)	79.95

Disc Drives:

(Two year warranty)	
MD400A (No PSU)	132.96
MD400B (With PSU)	149.95
MD802C (No PSU)	259.90
MD802E (With PSU)	289.95
MD802D/M (in Plynth)	309.95
MDCOMBO (5.25&3.5)	259.00
MD20M 20Mbyte Wini	659.96

Printers:

Dot Matrix:	
Citizen 120D (80col)	189.00
Star NL10 (80col)	209.95
Star NX15 (132col)	389.00
Epson FX800 (80col)	399.00
Epson FX1000 (132col)	549.00
Star NB24-10 (24pin)	599.00
Epson LQ800 (24pin)	599.00
Daisywheel:	
Juki 6100 (18cps)	343.56
Gakken GPR2000 (18cps)	199.95

Discs:

Box 96Tpi D.S. in plastic Library Case (5.25")	12.95
Box 30 96Tpi D.S. in Plastic Storage Box (5.25")	39.90
Box 10 135Tpi D.S. (3.5")	24.95
Box 10 96Tpi D.S. Unlabeled discs	6.90
Large Selection of Disc Storage Boxes	£6.90 to 19.90

A.T.P.L. Sidewise ROM Board.

The most popular and original Special Offer 39.33
2 AK Ram Chips 9.20

BBC & Master Spares:

BBC Power Supply	56.35
BBC Keyboard	49.95
BBC O.S. 12	12.58
BBC Basic II	19.95
BBC Cases (complete)	17.95
Master Power Supply	59.95
Master Keyboard	54.95
Master Batteries	4.95
Acorn 8271 Disc I/F	69.00
Acorn 1770 Disc I/F	49.95

Electronequip:
New for Master & Compact View
Printer Driver generator and menu
..... 12.95/13.95

Dust Covers:

We stock dust covers for most popular items. Here's a selection:

Master 128	4.49
Star NL10	5.41
Citizen 120D	5.50
Microvitec	6.46

ROM Software:

A selection from our large range:

Acornsoft	
View	44.95
Viewsheet	44.95
Viewstore	44.95
Overview	89.95

AMX

Mouse Super Art	79.95
Pagemaker	45.94
Max (Desktop)	18.95

Computer Concepts

Inter-word	49.00
Inter-chart	32.00
Inter-sheet	49.00
Wordwise Plus	49.00
Inter-base	60.00

LARGE SELECTION OF JOYSTICKS

Prices subject to variation without prior notification. Trade, Government and Education orders Welcome. **Barclaycard &**

Access, orders accepted. All prices include 15% V.A.T.

P&P Please add 92 pence. Securicor £6.90 per parcel.

Please send for our extensive Mail Order catalogue.

59 West Street Fareham Hants PO16 0AT

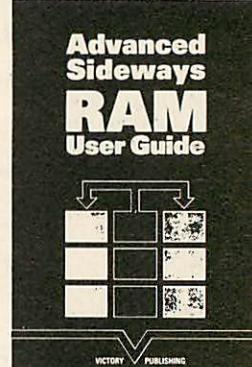
Tel: 0329-230670/1



RAM GUIDE

A U O F F E R

Bruce Smith's RAM User Guide



Sideways RAM is a technique central to the new Acorn Master series of computers. It allows you to load in software from disc or cassette which is designed to behave as if it were part of the machine, and is always on tap to the user.

Ex-Acorn User Technical Editor Bruce Smith's book, *Advanced Sideways RAM User Guide* for the Master and BBC computers will allow you to exploit sideways RAM to the full. The book is backed up with tried and tested software for you to use straight away or adapt to your needs (and for those with less nimble fingers it's available on disc).

Features of the book include: 25 programs and routines demonstrating the use of sideways RAM; compatibility tables and conversion notes for the BBC micro and Electron; writing languages and interpreters; extensive indexing; and there's even a ROM formatter developed by Bruce Smith for use on commercial software, ready for you to type in and use.

Please send me ____ copy/copies of the Advanced Sideways RAM User Guide by Bruce Smith at £9.95 (including postage)

Please send me ____ copy/copies of the book and the Master software* disc at the special price of £14.95 (normal price £17.90)

Please send me ____ copy/copies of the book and the BBC micro software* at the special price of £14.95 (normal price £17.90)

*Discs can be read on 40 and 80 track drives

I enclose my sterling cheque/postal order for £____ payable to Victory Publishing (European readers please add £2 per item for p+p, £5 for airmail)

NAME _____

ADDRESS _____

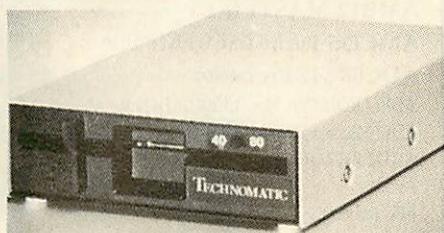
POSTCODE _____

Send this coupon with your remittance to Acorn User Merchandise Department, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

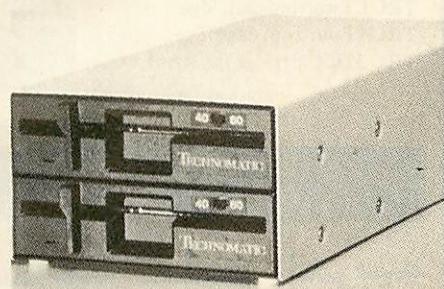
TECHNOMATIC

17 Burnley Road, London NW10 1ED Tel: 01-208 1177
 305 Edgware Road, London W2 Tel: 01-723 0233

TECHNOMATIC DISC DRIVES



TS 400



PD 800

A range of high quality high performance drives to meet the needs of all BBC Micro Users.

All drives fitted with high quality, slim line Japanese drive mechanism and necessary cables.

*All drives are fitted with high quality slim line ultra low power mechanisms capable of single and double density operation and offering fast track access and head setting times. Our confidence in their quality enables us to offer a two year warranty on these mechanisms without any extra charge.

*5.25" floppy drives are fitted with 40/80 track switches as standard at no extra cost. The switches are located in the front and clearly marked to indicate the status at a glance.

*The mechanisms are set inside attractively styled, sturdy metal casings painted in BBC beige colour.

*All drives fitted with all necessary leads and are ready for operation on unpacking. The drives with the mains power supply are supplied with a mains lead fitted with suitably fused 13A moulded plug.

5.25" Single Drives 40/80 switchable:

TS400 400K/640K £105 (b)

PS400 400K/640K with integral mains power supply £115 (b)

5.25" Dual Drives 40/80 switchable:

TD800 800K/1280K £185 (a)

PD800 800K/1280K with integral mains power supply £209 (a)

PD800P 800K/1280K with integral mains power supply and monitor stand £229 (a)

3.5" 80T DS Drives:
TS351 single 400K/640K £75 (b)



PS351 single 400K/640K with integral mains power supply £99 (b)

TD352 Dual 800K/1280K £134 (b)

PD352 Dual 800K/1280K with integral mains power supply £169 (b)

PD853 Combo Dual 5.25"/3.5" drive with psu. £209 (a)

DISC DRIVE MULTIPLEXER

TDM2

Dual Unit: 2 computers/one drive unit

TDM4

Quad Unit: 4 computers/one drive unit

£99 (b)

£134 (b)

£169 (b)

£209 (a)

£75 (b)

£135 (b)

TECHNOMATIC WINCHESTERS

Technomatic offer one of the most popular Winchester drives for the BBC Micro. We will include a front end utility for the BBC Master at no extra charge. Complete contents of the drive are displayed in icon format indicating the type of data in each file. Any file can be loaded by formatting the cursor to its icon.

P20HD TECHNOMATIC 20 Mbyte Winchester Drive

£499 (a)

P40HD TECHNOMATIC 40 Mbyte Winchester Drive with Acorn ADFS ROM

£749 (a)

P204HP TECHNOMATIC 20 Mbyte Winchester and a 80T DS floppy Drive built in a monitor stand. Includes ADFS Rom.

£769 (a)

P2041HT As P204HP but also with a 10 Mbyte tape streamer backup unit and backup utilities. Includes ADFS Rom.

£1295 (a)

TS10 10 Mbyte Tape Streamer Backup unit with utilities. £599 (a)

TFC10 10 Mbyte Pre-formatted Cartridge for use with P2041HT and TS10.

Special adaptor for S.J. File Server
Enquire for larger capacity
Winchesters.

These Winchesters are compatible with the S.J. File Server.

£599 (a)

£19 (d)

£28 (d)

WINCHESTER Drive Multiplexer

TWM2 for two computers.
 TWM4 for four Computers.

£99 (b)

£159 (b)

3M FLOPPY DISCS

New low prices plus Winter Olympic Competition

5.25" Discs in packs of 10

744 40T SS DD £8.50 (d)

745 40T DS DD £10.50 (d)

746 80T SS DD £11.50 (d)

747 80T DS DD £13.25 (d)

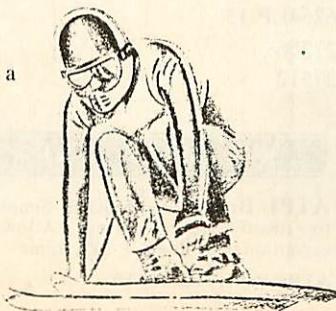
(Add £1 for library case packing)

Thousands of instant prizes to be won with 3M Discs. A draw for a trip to the Winter Olympics.
 Five 2nd Prizes of £1000 of recording instructs.

3.5" Discs in packs of 10

80T SS DD £15 (d)

80T DS DD £19.50 (d)



BULK DISCS

50 5.25" 40T single sided discs with sleeves in lockable box.

£25 (b)

50 5.25" 80T double sided discs with sleeves in lockable box.

£36 (b)

50 3.5" 80T double sided discs with sleeves in lockable box.

£60 (b)

FLOPPICLENE DRIVE HEAD CLEANING KIT

5.25" Kit with 20 disposable discs

£12.50 (d)

3.5" Kit with 20 disposable discs

£14.00 (d)

DISC STORAGE BOXES

DB340 Lockable 40 x 3.5" £8.50 (c)

DB550 Lockable 50 x 5.25" £9.00 (c)

DB570 Lockable 70 x 5.25" £11.00 (c)

DB5100 Lockable 100 x 5.25" £13.00 (c)

TECHNOLINE
(24 hr viewdata system)
Tel:01-450 9764

MAIL ORDER
17 Burnley Road
London NW10 1ED
Telex:922800

RETAIL SHOPS
15 Burnley Road, London NW10 1ED
Tel:01-208 1177 Telex:922800
(close to Dollis Hill Θ)
West End Branch
305 Edgware Road, London W2
Tel:01-723 0233
(near Edgware Road Θ)

For fast delivery telephone
your order on 01-208 1177
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

All prices ex VAT.
Prices are subject to
change without notice
Please add carriage
(a) £8.00 (Datapost)
(b) £2.50
(c) £1.50
(d) £1.00

PRINTERS

EPSON LX800

150 cps, variety of fonts, including
NLQ, bit image graphics, IBM char/
graphics compatible, centronics
interface and tractor feed as
standard

EPSON FX800

An enhanced version of FX85.
Call for details.

EPSON FX1000

An enhanced version of FX105.
Call for details.

EPSON EX800

EPSON EX1000

Colour option for EX800/EX1000.

EPSON LQ800

EPSON LQ1000

As LQ800 but wider carriage for 136
columns.

TAXAN KP815

Enhanced KP810 with 160cps and
full IBM compatibility.

TAXAN KP915

Enhanced KP910 with 180cps and
full IBM compatibility.

NATIONAL PANASONIC KX P1081

includes free Wysiwyg + Rom
and Printer Lead

STAR NL 10 (Parallel Interface)

STAR NL 10 (Serial Interface)

INTEGREX Multicolour Inkjet printer.

Ideally suited for high res colour VDU
screen dumps. Quietness & consistent
output are major characteristics.
BBC Screen dump for Integrex.

BROTHER HR20

8K buffer standard expandable to
16K. Parallel & Serial ports as
standard.

NAT PANASONIC KX P3131

Daisy wheel printer with 38K buffer,
17 cps, bi-directional, parallel
interface

JUKI 6100 Daisy wheel printer

15 cps, 2K buffer, switchable 10/12/15
cps proportional spacing, underlining.
Parallel interface.

Parallel Printer Lead (1.2m)

£209 (a)

£229 (a)

£315 (a)

£439 (a)

£409 (a)

£595 (a)

£59 (b)

£439 (a)

£609 (a)

£269 (a)

£369 (a)

£159 (a)

£190 (a)

£219 (a)

£549 (a)

£15 (d)

£349 (a)

£249 (a)

£310 (a)

£6 (d)

MODEMS

All modems listed below will be supplied with BBC
Publications ModemMaster comms package and a
BBC data lead.

MIRACLE WS4000 V21/23

£140 (b)

MIRACLE WS3000 V21/23

£265 (b)

MIRACLE WS3000 V22

£445 (b)

MIRACLE WS3000 V22 bis

£585 (b)

(All modems are BART approved)

BBC Data Cable for WS3000/4000

MIRACLE WS2000V21/23 & BELL stds

£7 (d)

WS2000 Auto Dial Card

£92 (c)

WS2000 Auto Answer Card

£27 (d)

WS2000 SK1 Kit

£27 (d)

£5 (d)

WS2000 User Port Lead

£5 (d)

TIME WARP

Real Time Clock. Plugs into the user
port, battery back up as standard,
includes manual, demo software
including a diary/planner application
program

£31 (d)

PLOTTERS

HITACHI 672

£495 (a)

LINEAR GRAPHICS

Full range of accessories available
for plotmate plotters

£282 (a)

A4S PLOTMATE

£342 (a)

A4SM PLOTMATE

£299 (a)

A3 PLOTMATE

£431 (a)

A3M PLOTMATE

PRINTER SHARERS & BUFFERS

BUFFALO PB Buffer

Parallel buffer for internal fitting to
most Epson printers. Simple to instal.
PB128 (128K)

£89 (c)

PERIPHERAL & COMPUTER SHARERS

High quality switches to allow the user to switch
between computers, printers, modems etc. Fully
shielded metal cases, all lines fully switched.

Parallel

Serial

2 Computers to 1 Printer 36v36-2 £25 (c) 25v25-2 £25 (c)

3 Computers to 1 Printer 36v36-3 £39 (c) 25v25-3 £39 (c)

4 Computers to 1 Printer 36v36-4 £45 (c) 25v25-4 £45 (c)

2 Computers 2 Printers X-over 36v36-x £49 (c) 25v25-x £49 (c)

BBC Cable set 3 to 1 (1m ea) £24 (c)

BBC Cable set 4 to 1 (1m ea) £30 (c)

BBC Computer Sharer: TCS26

1 computer to 2 printers fitted with
BBC cable

£22 (c)

Paper & Labels

Plain fanfold paper with microperforation:

2000 sheets 9 1/4 x 11" £12 (£3.50)

2000 sheets 14 1/2 x 11" £18.50 (£4.50)

1500 sheets A4 90gsm £18.00 (£4.00)

Labels/1000

Single Row 3 1/4 x 1 7/16" £5 (d)

Triple Row 2 7/16" x 1 7/16" £5 (d)

PROGRAMMING ACCESSORIES/ SOFTWARE

Compatible with B, B+ and Master

EepromRyter (Eepromer II)

Eeprom Ryter is compatible with
BBC Master only

£119 (b)

Upgrade of Eepromer II to Eeprom Ryter

(Please return your Eepromer II)

£49 (b)

EPROMER II

£89 (b)

MPROMER

£49 (c)

META ASSEMBLER

£145 (b)

PORTAL EPROM

£245 (b)

EMULATOR 512K

£145 (b)

TEAM Disassembler

£47 (b)

EPROM ERASERS

£59 (b)

UV1B 6 eproms, safety cutout

UV1T 6 eproms, timer, safety cutout

MONITORS

BBC lead incl with all monitors

MICROVITEC 14" RGB Monitors

Please specify plastic or metal case.

£179 (a)

Microvitec 1431

Standard Resolution 453 pixels

£199 (a)

Microvitec 1431AP

As 1431 + composite video and sound
input

£225 (a)

Microvitec 1451

Medium Resolution 653 pixels

£255 (a)

Microvitec 1451AP

As 1451 + composite video and sound
input

£359 (a)

Microvitec 1441

High Resolution 895 pixels

14" Medium Res Colour monitor
with RGB TTL and Linear input,
sound input. Front panel for brilliancy,
contrast, volume and mono/
colour options. Compatible with
BBC and PC Compatibles

£199 (a)

Microvitec 20" RGB/PAL/ Audio Monitors

Microvitec 2030CS

Standard Resolution RGB/Comp
Video

£380 (a)

Microvitec 2040CS

High Resolution RGB/Comp Video

£685 (a)

TOUCHTEC-501

Brings genuine touch screen operation
on metal cased Microvitec monitors,
incl utilities disc with starter and
development programs

£239 (b)

TAXAN SUPER VISION 620

12" Hi Res/Hi Contrast
Option to switch to green/amber
BBC/IBM Compatible

£269 (a)

TAXAN SUPER VISION 625

12" Super Hi Res and contrast RGB
Monitor with option to switch to mono
BBC/IBM compatible.

£319 (a)

12" MONOCHROME MONITORS

TAXAN KX 117

Hi Res green etched screen

£85 (a)

TAXAN KX 118

Hi Res Long Persistence (P39)

£90 (a)

TAXAN KX 119

Hi Res amber etched screen

£90 (a)

PHILIPS BM 7502

Hi Res green screen.

£69 (a)

PHILIPS BM7522

Hi Res amber screen.

£75 (a)

PHILIPS BM 7542

Hi Res White screen.

£79 (a)

MONITOR ACCESSORIES

Microvitec Swivel Base (14" plastic
monitors)

£17 (c)

Philips Swivel Base

£10 (c)

Monitor Stand Models B & B+

£10 (c)

Monitor Stand Master

£13 (c)

Double Tier stand Models B, B+ or
Master

£24 (b)

Taxan RGB Lead

£5 (d)

Microvitec Lead

£3.50 (d)

Monochrome BNC/Phono Lead

£3.50 (d)

TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE

17 Burnley Road, London NW10 1ED Tel: 01-208 1177

305 Edgware Road, London W2 Tel: 01-723 0233

CAD/DRAWING PACKAGES

NOVACAD
Cad Package for B, B & MASTER.
(See page 5 for specification)

Tracker Ball/Mouse Version (TM) £79 (d)

TM Version plus Tracker Ball £119 (c)

TM Version plus Mouse £105 (c)

Plotter Driver Generator £25 (d)

MOUSE

AMX MOUSE with SUPER ART
(pse specify B, B+ or Master)

PAGEMAKER

EXTRA/EXTRA
(utility for the Pagemaker)

MAX

STAND ALONE MOUSE
(includes horizontal scroll lock)

RB2 TRACKER BALL

RB2 Tracker Ball with Icon Master
(for B, B+ & Master)

RB2 Tracker Ball with Cursor Control
Rom
(for Master only)

RB2 Tracker Ball 'Stand Alone'
for use with NOVACAD & other
software

Cursor Control Rom for Master £12.50 (d)

MIRRORSOFT FLEET
STREET EDITOR £35 (d)

CP/M SOFTWARE

Send for details on our full range of
CP/M & PC DOS packages for
Business, Communications & High
Level Languages.

Please send for details on our range of CP/M
software for Acorn/Torch Z80 2nd Processors

BBC SOFT/FIRMWARE

All software supplied by us is known to
operate with the appropriate Acorn Disc
filing systems. We cannot comment on
their use with other DFS systems.

DATABASE MANAGEMENT SYSTEMS

VIEWSTORE £37 (d)

STARdataBASE £39 (d)

MASTERFILE II £17 (d)

ACORN OVERVIEW PACKAGE

Special Offer £57 (b)
(RRP £86)

WORD PROCESSORS

ACORN VIEW PROFESSIONAL £85 (c)

VIEW 2.1 £37 (d)

VIEW 3.0 £49 (c)

VIEW INDEX £12 (d)

VIEW PRINTER DRIVER £7 (d)

GENERATOR £29 (d)

VIEWSPELL £28 (d)

DOT PRINT PLUS £24 (d)

WORDWISE £38 (d)

WORDWISE PLUS £21 (d)

WYSIWYG PLUS £47 (d)

SPELLMASTER £47 (d)

INTERWORD £39 (d)
WORDEASE £24 (d)
SPELLCHECK III £31 (d)
EDWORD II £43 (c)

SPREADSHEETS
VIEWSHEET £37 (d)
WINDOWMATIC £15 (d)
VIEWPLOT £22 (d)
INTERSHEET £37 (d)
INTERCHART £26 (d)
ULTRACALC £29 (d)

MINI OFFICE II DISC Version
For B & B+ 40T or 80T £14.50 (d)
For Master 80T £17.30 (d)
For Compact £19 (d)

MINI OFFICE II ROM Version
For Master, Compact, B+ & B £48 (c)

LANGUAGES

META ASSEMBLER £145 (b)
TEAM DISASSEMBLER

MACROM £33 (d)

ACORN MICRO PROLOG £62 (d)

ISO-PASCAL £51 (c)

ISO-PASCAL STAND ALONE
GENERATOR £30 (d)

OXFORD PASCAL
(40 or 80T) Specify B or B+ £36 (d)

OXFORD PASCAL
for Master £52 (d)

ACORN LOGO £46 (c)

LOGOTRON LOGO £55 (c)

BBC PUBLICATIONS OPEN LOGO £59 (c)

ACORN LISP ROM £43 (d)

ACORN FORTH ROM £39 (d)

ACORN COMAL ROM £43 (d)

MICROTEXT £52 (c)

MICROTEXT PLUS £229 (b)

COMMUNICATIONS

TERMULATOR £25 (d)

COMMSTAR II £28 (d)

COMMUNICATOR £49 (d)

MODEM MASTER £11 (d)

COMMAND £34 (d)

MASTER TERMULATOR £34.75 (d)

UTILITIES

ACCELERATOR £49 (d)

ACORN BASIC EDITOR £24 (d)

MONITOR (BBC Pub) £19 (d)

BROM PLUS £26.50 (d)

SLEUTH £23 (d)

TOOLKIT PLUS £31 (d)

TOOLBOX 2 (BBC Pub) Manual £9.50 (d)

Cassette £9 (d)

ACORN GXR GRAPHICS ROM £24 (d)

specify B or B+ £24 (d)

PRINTMASTER £24 (d)

PRINTWISE £24 (d)

DUMPMASTER £26 (d)

FONTWISE PLUS £17 (d)

HERSHEY FONT CHARACTER £18 (d)

GENERATOR £29 (d)

ICON MASTER £26 (d)

MOVIE MAKER £7.95 (d)

Two Roms + Cassette £7.95 (d)

ADV TELETEXT UTILITIES ROM £7.95 (d)

COMPACT (all on 3½" disc)

ARTROOM £27 (d)

FONTWISE + £22 (d)

FONT EDITOR £22 (d)

RAMROD £37 (d)

BROM PLUS £32 (d)

MACROM £37 (d)

BETABASE £27 (d)

WHITE KNIGHT MKII £16 (d)

BBC PUBLICATIONS

BUNDLED SOFTWARE £18.50 (d)

BBC PUBLICATIONS EDUCATIONAL SOFTWARE

A series of programs developed in many cases alongside Radio & TV programmes by BBC's Education Department which supplement the classroom studies by moving and colourful displays helping in clear understanding of a variety of subjects. Some packages also include audio cassettes.

PRIMARY EDUCATION

ASTRONOMY £11 (d)

COMPUTERS AT WORK Aud/EC/disc £16 (c)

PICTURE CRAFT Disc £17 (d)

INTRODUCING GEOGRAPHY Disc £16 (d)

MATHS WITH A STORY 1 Cass £8 (d)

MATHS WITH A STORY 2 Cass £8 (d)

NUMBER GAMES Cass/EC £7.50 (d)

USING YOUR COMPUTER Cass £24 (c)

SECONDARY LEARNING

TECHNOLOGY & DESIGN Pt1 £21.50 (c)

ELECTRIC FIELDS £10.50 (d)

ADVANCED LEVEL

STUDIES: STATISTICS

ADVANCED STUDIES:

GEOGRAPHY Cass £10 (d)

INSIDE INFORMATION Prog Cass £10 (d)

Book £8 (d) Audio Cass £5 (d)

SCIENCE TOPICS (ST) Disc £14 (d)

S.T.:WAVES Disc £14 (d)

S.T.:RELATIONSHIPS Disc £14 (d)

S.T.:BONDING Disc £14 (d)

S.T.:ELECTROMAGNETIC Disc £14 (d)

SPECTRUM Disc £14 (d)

S.T.:ELECTRONICS IN ACTION Disc £14 (d)

S.T.:NEWTON & THE SHUTTLE Disc £19 (d)

S.T.:ECOLOGY Disc/EC £19 (d)

S.T.:POLYMERS Disc/EC £19 (d)

S.T.:CLASSIFICATION &

PERIODIC TABLE Disc £20 (d)

S.T.:FOOD & POPULATION Disc £20 (d)

SEC SCIENCE

MICROTECHNOLOGY Cass £7 (d)

SEC SCIENCE: THE

MOLE CONCEPT Disc/Aud/EC £16 (c)

GENERAL

VU-TYPE PROFESSIONAL Disc £19 (d)

WHITE KNIGHT MK II Disc £16 (d)

(for compact)

BATTLEFIELDS Cass £8.50 (d)

A VOUS LA FRANCE Cass/EC £17 (d)

Book £5.25 (d)

Audio Cassettes

(2) £7.50 (a)

Additional charges for discs £9.00 (d)

DEUTSCH DIREKT Disc/aud/EC £16 (c)

Book £5.95 (d)

MODEM MASTER £11 (d)

Cassette based programs listed above can be supplied

on disc at an extra charge of £1.50 per disc and please

specify the format required 40 or 80T.

TECHNOLINE
(24 hr viewdata system)
Tel:01-450 9764

MAIL ORDER
17 Burnley Road
London NW10 1ED
Telex:922800

RETAIL SHOPS
15 Burnley Road, London NW10 1ED
Tel:01-208 1177 Telex:922800
(close to Dollis Hill Θ)
West End Branch
305 Edgware Road, London W2
Tel:01-723 0233
(near Edgware Road Θ)

For fast delivery telephone
your order on 01-208 1177
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

All prices ex VAT.
Prices are subject to
change without notice
Please add carriage
(a) £8.00 (Datapost)
(b) £2.50
(c) £1.50
(d) £1.00

BOOKS

No VAT Carriage Code (c)

LANGUAGES	
6502 Assy Lang Prog.....	£19.95
6502 Programming.....	£13.95
8086 Book.....	£23.95
Acorn BCPI User Guide.....	£15.00
Acorn FORTH.....	£7.50
Acorn LISP.....	£7.50
Acorn ISO Pascal Ref Manual.....	£10.00
Intro to COMAL.....	£10.00
Intro to LOGO.....	£7.50
Micro Prolog Ref Manual.....	£10.00
Introduction to Turbo Pascal.....	£14.95
Prog the Micro with Pascal.....	£8.50
The Supervisor's BBC Micro.....	£10.95

BBC MICRO GUIDE BOOKS

Inside Information.....	£8.95
Maths Prog in BBC Basic.....	£7.95
The Friendly Computer Book.....	£4.50
Toolbox 2.....	£10.95

PROGRAMMING/UTILITY

Advanced Sideways Ram User Guide.....	£9.95
Advanced User Guide (BBC).....	£15.95
Applied Assembly Language on the BBC.....	£9.95
BBC Micro Advance Programming.....	£9.95
BBC Micro Ref Guide (B Smith).....	£10.95
BBC Micro Sideways ROM's RAM's.....	£9.95
Guide to the BBC Rom.....	£9.95
Beginners Guide to W.P.....	£7.95
Mastering Assembly Code.....	£8.95
Mastering Interpreters & Compilers.....	£14.95
Mastering View, Viewsheet & Viewstore.....	£12.95
View by B. Smith.....	£12.95
View 3.0 User Guide.....	£10.00
Viewstore User Guide.....	£10.00
Viewsheet User Guide.....	£10.00
Wordwise Plus.....	£9.95

SOUND & GRAPHICS

Computer Graphics & CAD Fundamentals.....	£9.95
Mastering Music.....	£6.95

DISC DRIVE SYSTEMS

Advanced Disc User Guide.....	£16.95
Disc Book.....	£3.50
Disc Programming Techniques.....	£7.95
Disc Systems.....	£6.95
File Handling on the BBC.....	£6.95
Discovering Disc Drives.....	£POA
Practical Disc File Techniques.....	£5.95
Mastering the Disc Drive.....	£12.95
Mastering DOS plus.....	£12.95

APPLICATIONS

Interfacing Proj for BBC.....	£6.95
BBC and Small Business.....	£5.75
The Software Business.....	£5.50

Mastering Operating System

(David Atherton) £12.95

PRINTER ACCESSORIES

EPSON ACCESSORIES:

Interfaces	
8143 RS232.....	£30 (d)
8148 + RS232 + 8k.....	£65 (d)
8177P NLQ for FX80 +/FX100 +.....	£99 (d)
Parallel & Serial Buffers of various size also available.	
LQ800 Tractor Feed.....	£47 (b)
LQ1000 Tractor Feed.....	£52 (b)
SHEET FEEDERS:	
LQ800.....	£135 (b)
LQ1000.....	£179 (b)
EX800.....	£135 (b)
EX1000.....	£309 (b)
FX800.....	£135 (b)

FX1000.....	£179 (b)
Ribbons:	
RX/FX100/100 +, FX105.....	£7 (d)
RX/FX80/80 +, FX85.....	£4 (d)
LX80/LX800.....	£4.50 (d)
LQ800.....	£8.50 (d)
LQ1000.....	£10 (d)
EX800/1000.....	£7.50 (d)
H180 Pen Set (Aqueous/Ball point).....	£8.25 (d)
HITACHI 672 Plotter	
Aqueous Pen Set six pens.....	£18.50 (d)
Oil Based Pen Set six pens.....	£25.00 (d)
TAXAN CANON Accessories:	
Ribbon, KP810/815/910/915.....	£6 (d)
Star Printer	

NL10 Sheet Feeder.....	£52 (b)
NL10 Ribbon.....	£4.50 (d)
National Panasonic KX P1080/81	
Spare Ribbon.....	£4.50 (d)
KXP3131 Tractor.....	£90 (a)
KXP3131 Sheet Feeder.....	£189 (a)
JUKI 6100	
Tractor Feed.....	£149 (a)
Ribbon (Carbon).....	£2.00 (d)
Sheet Feeder.....	£219 (a)
BROTHER HR20	
Tractor Feed.....	£116 (a)
Spare Ribbon Nylon.....	£3.00 (d)
Spare Ribbon Carbon.....	£4.50 (d)
INTEGREX INK JET COLOUR PRINTER	

Spare Ink Cartridge Black.....	£9 (d)
Spare Ink Cartridge Colour.....	£15 (d)
Paper Roll.....	£7 (d)
Printer Leads:	
BBC Parallel Lead (1.2m).....	£6 (d)
PAPER & LABELS	
Plain Fanfold paper with micro perforations:	
2000 sheets 9 $\frac{1}{2}$ " x 11" 60 gsm/sq m.....	£12 (£3.50)
2000 sheets 14 $\frac{1}{2}$ " x 11" 60 gsm/sq m.....	£18.50 (£4.50)
1500 sheets A4 90 gsm.....	£18 (£3.50)
Labels/1000:	
Single Row 3 $\frac{1}{2}$ " x 1 $\frac{7}{8}$ ".....	£5.25 (d)
Triple Row 2 $\frac{1}{2}$ " x 1 $\frac{7}{8}$ ".....	£5 (d)

WYSIWYG PLUS

WYSIWYG PLUS is a printer and screen utility for Wordwise Plus, View, Interword, and Basic users, supplied on a 16K Eprom. To obtain a particular printer effect, such as enlarged text, it used to be necessary to discover the appropriate 'printer control code' from your manual and incorporate it into your text. Secondly, you had to print several trial copies in order to position the effect correctly in relation to the rest of your text.

WYSIWYG PLUS simplifies this trial and error approach using easily remembered *commands. For example, *ENLARGED not only selects enlarged text on your printer, but

WYSIWYG PLUS is designed to work with the following systems:

BBC Model B 6502 Second processor,
BBC Model B+ Turbo coprocessor
BBC Master 128 All printers (Except lasers)
BBC Compact

WYSIWYG PLUS workspace is relocatable.

WINDOWMATIC

All users of Acorn's VIEWSHEET spreadsheet program will be aware of its powerful windowing facility which allows the screen and/or printer to be configured in up to 10 separate windows taken from anywhere in the sheet. They will also be painfully aware of how difficult and time consuming it is to set up a required display. Although VIEWSHEET allows configurations to be saved to the media, it does not have provision for deciphering them.

WINDOWMATIC has been produced with the intention of rectifying these shortcomings and to bring out the very best from VIEWSHEET.

WINDOWMATIC provides a quick and easy

VU-TYPE

Do you have finger trouble when typing?
Do your letters look like this?

Dear Sir,
I would like to.....

then you need:

VU-type, a complete touch typing program produced by BBC/Pitman.

It allows you to learn at your own pace and has a wide range of exercises. Screen displays show the keys you have pressed and it will report on your speed and accuracy.

Supplied on a 40T Disc with a manual.

Available at a special price of £7.50 (d)

instead of the usual £15. Offer valid while stocks last

way to configure screen and printer allowing complicated documents and reports to be set up much more easily. It displays complete text information on all 20 windows and accurate graphic representation of the screen and printer output.

The package includes a screen dump routine for Epson printers and allows use of other printer dump packages.

WINDOWMATIC is compatible with BBC Master and BBC B+. A 6502 2nd processor must be fitted to a model B to run Windowmatic. Windowmatic is fully compatible with Turbo and 6502 2nd processor.

The program is supplied on disc with a comprehensive manual.

EDUCATIONAL/FUN SOFTWARE BUNDLE

Wordmover
Wordplay

Pantry Antics

Drawstick
Locomotion

These programs are supplied from the BBC Publications Educational Software range and will be supplied on a 5.25" disc for BBC Master, B+ and B and on a 3.5" disc for the Compact.

5.25" Disc £17.50 (d)

3.5" Disc £18.50 (d)

(Normal RRP over £40)

TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE

17 Burnley Road, London NW10 1ED Tel: 01-208 1177

305 Edgware Road, London W2 Tel: 01-723 0233

NOVACAD

Computer Aided Draughting for the BBC Micro

"Novacad can drive a plotter to provide drawings of a high quality ... Novacad is excellent. It is flexible, genuinely easy to operate without much practice, and a pleasure to use. " Beebug December 1986

A sophisticated CAD package with unique facilities which are generally confined to the professional CAD packages costing thousands of pounds.

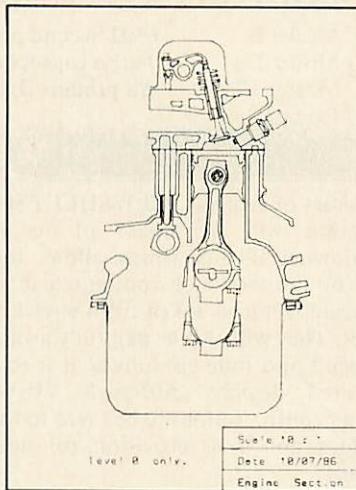
NOVACAD is being used in widely differing fields ranging from leading British industries for producing engineering drawings to Accountants' offices for producing flow charts. Architects,

"Novacad is a professional package, well worth the £90 for the ROM and disc and is expandable to suit your own particular requirements. I would have no reservations if I heard Novacad called, "the best on the market". " A&B Computing August 1986

engineers, plumbers, kitchen planners and many other professions requiring easy to use facilities for producing professional quality output are making extensive use of NOVACAD's unique features. NOVACAD is proving to be a invaluable teaching aid in technical schools and colleges simply because of the ease with which it can be used.

NOVACAD'S MAJOR FEATURES

- * Simple and easy to use with logical command sequence.
- * A large drawing area (approx 15 screens).
- * The ability to create complex icons (upto 500 lines instead of the usual 15 to 20 pixels), store them in a library and recall them at different scales and orientations.
- * A zoom facility allowing magnification of up to 20 times to insert finer details.
- * Block copy of shapes on the screen for repetitive use.
- * Text entry at any 90° orientation at any position on the screen.
- * Create multi layer drawing with 8 levels available.
- * Full compatibility with the BBC range with minimal hardware requirements yet having the capability of exploiting the potential of the extra shadow memory or the second processor's memory and speed.
- * Printer routine for Epson 80 and 136 column printers.
- * A unique optional facility to output to any BBC compatible plotter.
- * Cursor control from keyboard, tracker ball or mouse.



NOVACAD package includes a 16K ROM, Utility disc and a comprehensive manual.

MINIMUM HARDWARE REQUIREMENTS

- Any BBC range computer with Acorn DFS.
- 40 Track single sided single drive.
- Epson compatible dot matrix printer.

With basic BBC B, NOVACAD operates in mode 4 allowing use of any 2 colours. With shadow memory of the BBC+ or the Master, it can also operate in mode 0 for higher resolution or mode 1 for allowing use of any 4 colours, and it will provide additional user memory for more complex drawings.

6502 second processor or the Turbo on the Master will also increase the drawing speed considerably.

OPTIONAL EXTRAS

Plotter driver generator is available as an optional extra to configure a plotter routine for any BBC compatible plotter. Pre-configured programs for the popular plotters like Epson HI 80, Hitachi 672, Plotmate, Penman and HP GL. This program allows the drawing to be scaled to the maximum plotter size thus enabling drawing of A2 and A3 sizes to be produced with equal ease. The zoom facility will enable inaccuracies of drawing on the screen to be eliminated.

ROUTCAD, an optional software package for our Graphics Workstation allows for production of shapes drawn using NOVACAD in 3D on suitable material and is ideal for a range of applications including template making and model building.

EpromRyter

A powerful eprom programmer for use with the BBC Master. It offers the latest 'state of the art' programming techniques to provide fast and efficient operations.

The software is totally menu driven and on screen help messages make the programming simple for both specialists and novices alike.

The EPROMRYTER interfaces with the Master through 1 MHz bus. It is mains powered with its own psu. 3M Textool zif socket has been fitted to ensure consistent and reliable service over long periods.

The single rail eproms handled by the EpromRyter are:

- 2716 2732 2764 27128 27256 27512 27513 27011
- 2516 2532 2564 (NMOS & CMOS)
- One time eproms P27XXX, 87CXXX etc.
- Also A suffix eproms such as 27XXXA

EPROMER II

A proven Eprom programmer for BBC Model B and B+ with thousands in use in industry, educational and R&D establishments. It offers many of the powerful features of the EpromRyter and can program all single rail eproms upto 27256. Full details on request.

The main features of the programming software are:

- * Device, function and voltage selection from the computer keyboard.
- * Continuous display of the options selected.
- * All eproms upto 27512 (64K) programmed in single pass.
- * Automatic Intelligent identifier support for eproms able to respond.
- * Selectable programming voltage 25/21/12.5V
- * 3 programming methods: Normal, Intelligent & Pulse (20 sec for a 27128).
- * Serial port protocols supported.
- * DFS, NFS, ADFS and Rom Filing System Supported.
- * BASIC/Machine Code programming using RFS.
- * Powerful editor with input in HEX or ASCII.
- * Full editable 64K file.
- * Block move of data within the address range.
- * User can select any section of the eprom from single byte to the full address range to blank check/burn/verify. Facility to program single bytes makes program development/amendment simpler.
- * Multiple loading for ROM Filing System

Some of the above features apply to Master Computers only

TECHNOLINE
(24 hr viewdata system)
Tel:01-450 9764

MAIL ORDER
17 Burnley Road
London NW10 1ED
Telex:922800

RETAIL SHOPS
15 Burnley Road, London NW10 1ED
Tel:01-208 1177 Telex:922800
(close to Dollis Hill Θ)
West End Branch
305 Edgware Road, London W2
Tel:01-723 0233
(near Edgware Road Θ)

For fast delivery telephone
your order on 01-208 1177
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

All prices ex VAT.
Prices are subject to
change without notice
Please add carriage
(a) £8.00 (Datapost)
(b) £2.50
(c) £1.50
(d) £1.00

Technomatic's 20Mbyte Winchester Drive

- * Cased with power supply and cooling fan
- * 1 MHz bus extension cable
- * Fully compatible with Acorn ADFS and FS III
- * Fully compatible with S.J. Research file server
- * 12 months warranty
- * Special front end utility for BBC Master

FREE MASTER OFFER

Every Master and Master Compact purchased at our usual price will include the following:

An educational/fun bundled software package comprising of:

**VU-Type, Wordmover, Wordplay, Drawstick,
Locomotion and Pantry Antics**

META Version III

"All the good features you would expect to find in a good source code editor are present . . . Meta assembler lives in a different world. It is structured to work with any new processor . . . as new instruction sets can be added . . . as needed . . . has a well featured editor with colour highlighting, a sound modular approach."

Acorn User October 1986

- Assembles for over 30 popular processors, including Z80, 6800/01/02/04/05/09/11 etc — and 68000 — using native mnemonics for each processor, eg. LD A, (HL) for Z80 and MOV AO, \$1000 for 68000 etc.
- Fully integrated Editor: four field, all search, search/replace, block copy, delete, move, marked save, load etc.
- Compatible with Portal Eprom Emulators and Team Disassemblers.
- Send object code in Intel Hex, S-Record, straight binary etc. down to discs, RS232, parallel port, Eprom Emulators etc — all during Assembly.
- Over 50 directives included as standard: handling nestable macros, conditional assembly and twenty types of table definition directives.
- 32 bit labels; 31 character names. Arithmetic and Boolean arithmetic to 32 bits.
- Modular source code with numeric and string parameter passing.
- Serial communicator area with eight options lines: echo, control code trap, LF suppression/addition etc.
- Over 500 in use throughout the world in universities and many different industries.
- Two 16K Rom, two 80 track discs, A4 ring-band manual, function-key strip.

PORTAL EPROM EMULATORS

- Emulates 2716, 2732, 2764, 27128, 27256, 27512 eproms at 150ns Access time.
- Load at 4Kbytes/second — No "erase" time.
- 28 pin header plugs into Eprom socket on target system — status monitored on 13 Leds.
- Fully software controlled from Meta Assembler.
- 100 times faster than standard EPROM program/erase cycle.
- Fully CMOS compatible; draws no power from target system.
- Four portals may be independently programmed off same user-post cable.
- Complete with all cables, manual and disc.

PORTAL 512 (2716, 2732, 2764, 27128, 27256, 27512).



**Only
£499 (a)**

(This offer valid whilst current stocks last)
Special Adaptor for S.J. Research File Server £28

3½ DISC DRIVES

- * 400K/640K capacity per drive in DFS/ADFS modes
- * Mitsubishi 80 track double sided ultra low power, fast access mechanisms
- * The drives are supplied fully cased and with cables ready for connection to a BBC Computer
- * Drives powered from the computer * 2 years warranty

Single Drive £75(b) Dual Drive £134(b)

TEAM DISSASSEMBLER

The third part of the Universal Development System: a Meta labelling disassembler.

Supports 1802, 8080, 8085, HD64180, Z80, 65XX (includes 65 col, 6511 etc), 68XX (includes 00, 01, 02, 03, 08 etc):

- Up to 64K of object code translated back into META compatible source code modules: labels automatically inserted on all jump targets, memory references etc.
- Pre-editing stage allows marking of object code areas as byte, string, word, long word etc, tables. These areas disassembled into appropriate directives instead of garbage mnemonics.
- Reconstituted source code ready for immediate re-assembly by META.
- Omniversal search/replace for re-naming arbitrary label names with meaningful ones.

NEW

THE TECHNOMATIC BBC CATALOGUE REVISED AUTUMN CATALOGUE

**£10 Voucher
Offer**

This advertisement can only show an example of the range of products stocked by Technomatic. So send for our latest Autumn BBC catalogue providing detailed information and prices on BBC Computer Systems, Peripherals, Software and Books. Inside you'll find a £10 voucher discount offer on orders worth over £200.

Technomatic is a BBC Computer and Econet Referral Centre providing a professional and reliable service to the BBC user. To obtain your free copy please complete and return the coupon below.

NAME.....

ADDRESS.....

.....

Post Code.....

10/87
Return to Technomatic Ltd, 17 Burnley Road, London NW10 1ED

MOVIE MAKER



BECOME A MOVIE DIRECTOR!

With the **MOVIE MAKER** software package from Slippery Slug **ANY** user can create impressive animated films or graphics displays.

A flashing pen is moved around on the screen by using the four arrow keys and is used to draw items of background scenery. The screen can be scrolled over the scenery to give a virtually unlimited area.

Use the pen to draw your animated characters, each up to about one quarter screen size. Their movement over the scenery is programmed by simply moving them around with the arrow keys.

SOME MOVIE MAKER FACTS

Text can be used in the form of subtitles, scrolling bubble messages which appear above the character that's speaking, or scenery.

The characters can also be easily programmed to move arms and legs, change colour or shape in any way, and to grow or lose extra parts of any description.

The teletext graphics system has been used throughout. This enables **MOVIE MAKER** to playback your movies at an incredible speed of 22 frames per second. And also enables a single movie to be over 20 minutes in length.

THE MOVIE MAKER PACKAGE

The package contains two 16K ROMS: USER GUIDE; key strip; scenery planning map; and a tape containing a 20 minute demo movie, an intro show, and playback software to run your movies on micros without **MOVIE MAKER** fitted.

Requires a BBC model B, B+, or MASTER micro, tape or disc based. Can be run in sideways RAM.

Mail order price £29.90 fully inclusive. Or for a detailed description of **MOVIE MAKER'S** extensive facilities send £1.95 for the introductory pack (price refundable against purchase) which contains an intro tape and brochure.

To: Slippery Slug, PO Box 83, Bath, BA1 1ZA.
Telephone Bath (0225) 69236

Please rush me the following:

Qty **MOVIE MAKER** pack(s) at £29.90 each.
Qty Introductory pack(s) at £1.95 each.
Cheque/PO enclosed for £

NAME _____

ADDRESS _____

Postcode _____

Flexibility + computers + language learning

Wida Software

Gapmaster

for gapped texts with alternative answers

Wordstore

create your own living dictionary on disk

Storyboard

the classic text reconstruction package

Matchmaster

for matching words, phrases, sentences...

Testmaster

for fill-in tests with alternative answers

Speedread

reading comprehension with variable speed

Pinpoint

for developing reading inference skills

Choicemaster

for creating multiple choice activities

Vocab

6 vocabulary games using your word lists

Helter Skelter

3 word classification games

All available in English, French, German & Spanish versions.
Most feature word-processing text entry for the teacher.

Wida authoring programs are used in more than 3000 schools, language schools, colleges, universities, businesses, hospitals, prisons and special needs learning centres.

WIDA SOFTWARE LTD,
2 Nicholas Gardens, London W5 5HY
Tel: 01-567 6941, 01-840 6534

The Schools Computer CLUB



AUTHORISED SUPPLIERS TO MOST LEA'S

We offer **MASSIVE DISCOUNTS** of up to 80% on all **EDUCATIONAL AND HOME** Computer Software requirements

PLUS A further 10% agency discount on all purchases!

For details of our current **SPECIAL OFFERS**
& 1987 Catalogue

- * Call Jeanne Isbister on 0532 687789
- * or Write to us:-

Contact Name _____

TEL: _____

School _____

Best Time to Contact:

Address _____

No of Catalogues:

Post Code: _____

The Schools Computer Club

8/8A Regent Street, Chapel Allerton, Leeds LS7 4PE



ALL OUR PRICES INCLUDE CARRIAGE & VAT

HSV COMPUTER SERVICES LIMITED

23, Hampstead House, Town Centre, Basingstoke, RG21 1LG.

NEW LOWER PRICES

DISKETTES	QUANTITY	10	20	30	40	50	100
3½ SS/DD	135TPI	13.95	26.50	37.50	49.00	60.00	110.00
DS/DD	135TPI	15.95	30.50	43.50	57.00	70.00	130.00
5¼ SS/DD	48TPI	5.95	8.95	12.75	16.00	18.75	36.95
DS/DD	48TPI	6.95	9.95	13.95	16.95	19.95	37.95
DS/QD	96TPI	7.95	10.95	14.95	17.95	21.95	39.95
★COL DS/QD	96TPI	8.95	14.95	21.95	28.95	35.95	63.95
UNIVERSAL	96TPI	8.95	14.95	21.95	28.95	35.95	63.95

COLOURS AVAILABLE: Red, Blue, Green, Yellow, White, either in boxes of ten or mixed, two of each. Please state when ordering.

★★ Universal disks are suitable for 40/80 track drives and have 2 notches and 2 holes. All 5¼ disks supplied in cardboard boxes with write protect tabs labels and envelopes and come with our no quibble money back or replacement guarantee.

DISKETTE STORAGE BOXES

10×5¼" Library Case	
50×5¼" Hinged Lid	1.25
50×5¼" Hinged Lid Lockable	6.50
100×5¼" Hinged Lid Lockable	7.50
120×5¼" Hinged Lid Lockable	10.50
10×3½" Library Case	12.50
40×3½" Hinged Lid Lockable	1.25
80×3½" Hinged Lid Lockable	7.95
	10.95

NEW LOWER PRICES

PRINTER STANDS 80 COLUMN

Smoked brown acrylic for rear or centre feed printers £14.95

TILT 'N' TURN MONITOR STANDS

12" Monitor £12.95
14" Monitor £14.95

Continuous Stationery (micro perf all edges)

9.5" x 11" 60 GSM - White	250 £2.95	500 £4.95	1000 £8.95	2000 £14.95
True A4V90 GSM - White	5.25	8.75	14.95	-
True A4 100 GSM -	7.25	13.50	25.50	-
cream, blue, grey, white.	-	2.95	4.95	9.50
Labels 3.5" x 1.5" (1 across)	-	3.25	5.50	10.50
Labels 4.0" x 1.5" (1 across)	-	3.75	6.50	11.95
Labels 4.0" x 1.5" (2 across)	-	2.75	4.50	8.50
Labels 2.75" x 1.5" (3 across)	-	-	-	-

PRINTER RIBBONS

	COL	BLACK
Canon PW1080/1186 ★★★	3.95	2.95
Centronics GLP	3.95	2.95
Citizen 120D	N/A	4.95
Epson FX/MX/RX80	3.95	2.95
Epson LX80/86	3.95	2.95
Epson MX100	3.95	2.95
Juki 6100 S/S	3.95	2.95
Juki 6100 M/S	3.95	2.95
Mannesmann Tally MT80/80	N/A	2.95
Oki Microline 80/82/83	N/A	1.50
Panasonic KXP1090, 1080	N/A	2.50
Seikosha GP80	2.50	3.95
Seikosha GP100	N/A	1.50
Shinwa CP80	N/A	3.95
Star SG10/SG15	N/A	2.75
Taxan Kaga ★★★	2.50	3.95
	3.95	1.50
		2.95

COLOURS AVAILABLE: Red, Blue, Green, Brown, Purple, Orange, ★★★ Red or Blue only. Please state when ordering

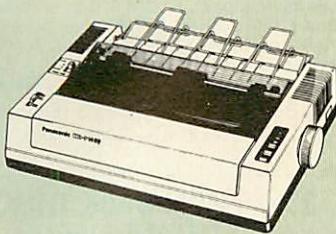


Credit Card Hotline (0256) 463507 Faxline (0256) 841018



Panasonic KX-P1081

(Now IBM/Epson Compatible)



Available NOW at a superbly realistic price, the KX-P1081 perfectly balances features, quality of construction and Value for Money to produce the printer of tomorrow, here today, ready to sweep the current generation of machines away.

Ingenious innovation in terms of software control codes permits great flexibility when it comes to defining the print style. A nippy 120 cps of clear Draft text backs up the crisp 24 cps Near Letter Quality text mode, with upto 40 superbly useful downloadable characters. A delightful range of assorted character widths is efficiently supported, with sizes ranging from a broad 5 cpi to petite 17 cpi, EVEN in NLQ mode. Some of the extensive support for serious use includes specialised functions to perform justification, centering and even left and right ranging. Proportional spacing permit even greater freedom when it comes to advanced use. Not only is the full Epson RX compatible control code set implemented, but extra codes have also been added to cater for the NLQ options, etc.

A full 96 ASCII character set is supported, with an extended set of 32 international characters and IBM special characters as well as IBM block graphics characters. A 1K Print Buffer alleviates much of the wait time normally associated with printing, whilst the bi-directional logic seeking print head takes the quickest route to print as required.

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us).

Special Price: £149 (carr. £7)

Optional RS232 Interface: £39

Panasonic KX-P3131 Daisy-Wheel Printer

This low-cost high-performance Daisy Wheel printer is ideal for anyone wishing to produce clear, immaculate letters or reports. It delivers, flawless text at 10, 12 & 15 CPS. Supports proportional spacing. Is Bi-directional, logic seeking. Printing speed: 17CPS. Has 6k printer Buffer. A printer of similar spec could cost a lot more than our ridiculously low price of:

Only £245 (carr. £7)

Single Sheet Feeder	£195
Tractor Feed	£90
Spare Ribbon	£3.00

Acorn-Olivetti JP101 Ink Jet Printer

One of the main problems with most printers is that they are hopelessly noisy. How often have you wanted to print something late at night but not done so for fear of waking the children? Also ideal for those working in quiet environments such as libraries, etc. Silence the complaints with the serious solution from Watford at the amazing cost of only £59 (Offer valid while present stocks last)

JP101 accepts 9½" standard fan fold paper or single A4 sheets. Tractor & Friction feed supplied as standard - print speed 50 cps.

Pack of 4 refills £10

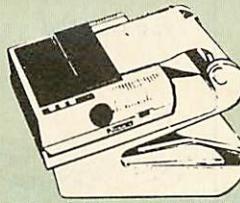
Screen Dump ROM for JP101 £10

Anti-Glare VDU Screen

This extremely effective, easy to install, 12" VDU screen eliminates harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for all wordprocessor users.

£12

Printer Stand Type-YU-S25



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

£26



We stock a range of monitors to suit all needs. Choice of a monitor is a matter of personal taste so we recommend that whenever possible, you ask for a demonstration at our shop. All Monitors are supplied complete with connecting lead.

MICROVITEC 14"

- 1431 - Medium resolution as used on the BBC television computer programme £175
- 1451 - High resolution, suitable for word processing in mode 0 £225
- 1441 - High res, exceeds the capabilities of the BBC micro £359
- 1431AP RGB + PAL and AUDIO £199
- 1451AP RGB + PAL and AUDIO £255
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239

KAGA-TAXAN 12"

- TAXAN KX117 Hi-res Green Monitor £80
- TAXAN KX118 Long persistence Hi-Res Green Monitor £90
- TAXAN KX119 Ultra-Hi-Res Amber Monitor £90
- TAXAN Super Vision 2 Type 620 Hi-res RGB Colour monitor. Ideal for Wordprocessing £269
- TAXAN Super 3, Type 625 Ultra Hi-res, RGB Colour) Text mode switch allows monochrome text display in Green, Amber, White reverse or White on Blue £319

STAR BUY

- PHILIPS 14" Hi-Res, dark glass, attractively finished Colour Monitor - supplied complete with RGB, SKART and Audio/Phono connectors. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display.

ONLY £209

ZENITH

"Test Bureau Recommended for use in Education"

12" high resolution monochrome monitor. Ideal for word processing as its green or amber screen is very restful to read. (These are the same professional quality, stylishly finished monitors as used in the larger Zenith PC Systems.)

Green (New Design) Hi-res	£69
Amber (New Design) Hi-res	£74
LEADS	
BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for KAGA	£3
N.B. carriage on Monitors £7 (securicor)	

SWIVEL BASES

for Video Monitors

By placing your monitor on one of our superb swivel bases, you gain the freedom to adjust the monitor viewing angle to suit your needs. By doing this, you alleviate eye strain and reduce back stress. Front adjustable without lifting the monitor.

for 12" Monitors £8 (carr. £2.50)
for 14" Monitors £10 (carr. £2.50)

MEGABUFFER 256



This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. It allows the computer to print 256,000 character in a short time thus freeing the computer very quickly. In short it makes light work of printing large documents, screen dumps, etc. It is extremely simple to connect. The features are:

- Low Cost, High performance.
- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatibility with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in test unit for both the buffer & your printer.

In conclusion it can safely be said that MEGABUFFER 256 is the ultimate printer Buffer for both the amateur and professional user.

Only £125 (carr £2)

CO-PRO Adaptor



Now for the first time you can add the Master Co-processor boards, to your standard BBC model B, or B Plus. With this brand new launch from Watford Electronics you can attach any BBC Master co-processor to the original BBC Micro. Once again Watford strides ahead with a new concept in BBC B Micro add-ons. This unique external Co-Pro Adaptor, is protected by patent applications.

Use the super fast Turbo Board with your BBC B, it is much faster than the 6502 2nd processor superseding it.

With the 512K add-on your standard BBC machine achieves IBM PC compatibility at a realistic price running GEM, Lotus 123 and many other programs. Included with the 512K package is a high precision mouse and the Digital Research GEM suite of software; GEM Desktop, GEM Write, GEM Paint. This requires both the 1770 DFS and the ADFS to be fitted to your computer.

To use other co-processors you require a BBC B with DFN 1.20 or higher, or BBC B+ fitted with 1770 DFS 2.20 or greater. Co-processors work exactly like a second processor.

Master owners may use Co-Pro to add a second Co-processor externally.

Watford, brings power to your BBC at only:

£50.00 (carr £5)

Continued

THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED (BOOK)

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities - he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out. Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible Printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from BASIC and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

NOW WITH EXTRA FEATURES AT NO EXTRA COST - Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

If you already have the Watford Electronics DFS and wish to incorporate these new facilities then simply return your existing DFS ROM to us together with £5 remittance for an upgrade. Please pack the ROM securely and address the package to our Upgrades Dept.

WATFORD's & ACORN's SINGLE DENSITY DFS

Watford's popular and widely acclaimed DFS has now been available for four years, and has gained a large following amongst serious users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. (P.S. Watford's highly sophisticated DFS is fully compatible with Acorn DFS). (not Acorn's 1770 DFS)

- Complete Disc Interface Kit including DFS ROM and fitting instructions £54
- Acorn's 0.90 DFS Kit complete £52
- DFS Manual (Comprehensive) (no VAT) £6.95
(P.S. Our comprehensive DFS Manual covers both Acorn & Watford DFSs).
- Watford's sophisticated DFS ROM only £16
- We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only £12
- DNFS ROM only £17 • ADFS ROM only £25
- Watford's DFS is exclusively available from Watford Electronics and their appointed dealers only. Every ROM carries a special label with LOGO and serial number.

NEW WATFORD's Mk II Double Density DFS INTERFACE

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our DDFS board has been adapted to allow the use of Acorn ADFS.

Added features include:

- Acorn ADFS compatible - Use ADFS on our DDFS board.
- Tube host Code - No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing - no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation - ensuring compatibility with almost all software.
- New low profile - small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations - BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk - Ours allows both of these!

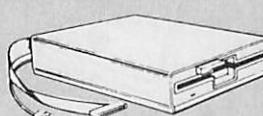
If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only £30.00.

- Special introductory offer £39.00
- DDFS Manual (No VAT) £6.95
- We will exchange your Existing DFS or DDFS for our DDFS for only £25.00

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange their ROM for the new version.

SPECIAL DISC DRIVE/DDFS OFFER

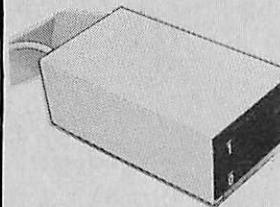
Type CLS400



- The popular Mitsubishi 400k Single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's popular DDFS Disc Interface (allows 720k storage). Will run in both Single and Double Density modes 40/80 track Software switchable.
- A comprehensive User Friendly Manual.

A Bargain at Only £125 (£6 Carr)
(Offer valid while stocks last)

3½" TWIN 800K DISC DRIVE OFFER



These top quality 3½" Disc Drives are attractively finished in BBC beige and are supplied complete with Cables. They run directly from the BBC B/Master's own PSU.

Special Offer £126

DISC DRIVE SHARER

(Ideal for educational establishments)

At last, a low cost alternative to the econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disc, and red means that you are next in line.

The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not compatible with ADFS.)

Launch Price: £59 (Price includes 3 Cables)

MYSTERIES OF DISC DRIVES & DFS REVEALED (BOOK)

Are you tired of faulty cassettes, and lengthy loading times? Do you want to upgrade your BBC micro to take discs but you get tied up in the plethora of jargon surrounding the choice and use of these systems.

Then The Mysteries of Disc Drives and DFS Revealed is the book for you. It explains in detail the different types of systems available, how they are installed and how to use them. Many examples are given including pre-written programs to call various functions of the DFS available only through Operating System calls. Different types of disc, 40/80 tracks etc. are all explained. This book is ideal for the beginner confused by the plethora of choice available in the marketplace.

£5.95 (Book No VAT)

DISC ALBUMS

Attractively finished in antique brown leather look vinyl. Stores upto 20 Discs. Each disc can be seen through the clear view pocket.

£4

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of a cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3½" & 5¼", please specify.

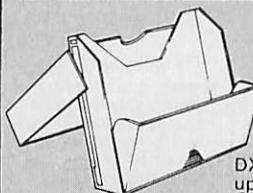
£7

ANTISTATIC LOCKABLE DISC STORAGE UNITS

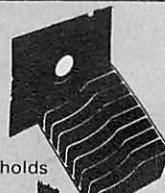
Gives double protection -
Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage.
The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.



- M35 - holds upto 50 5¼" discs £6.50
- M85 - holds upto 95 5¼" discs £8.00
- M50 - holds 50 3½" Discs £7.50



PLASTIC LIBRARY CASES
Holds up to 10 5¼" Discs. Only £2.00
DX-08: This extremely handy unit holds upto 8 5¼" Disc while in use. Only £2.00



DUST COVERS (For our Disc Drives)

Single CLS (without PSU) £3.20 Twin CLD (without PSU) £3.85
Single CS (with PSU) £3.95 Twin CD (with PSU) £3.90

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.

The first capacity given in the first column indicates capacity in single density mode. That within the brackets is the capacity in double density mode. All disc drive type numbers start with the prefix "C".

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.

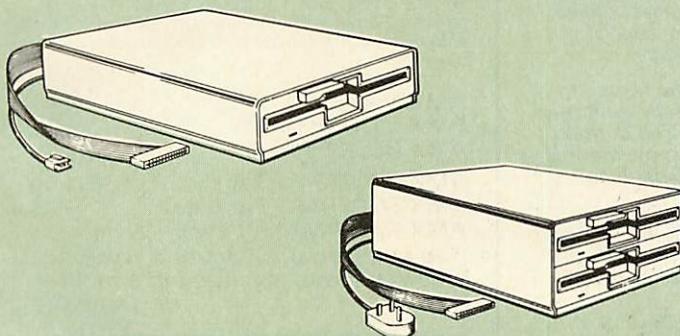
Various other "manufacturers" of disc drives for the BBC micro (more accurately, "packages" label other manufacturers drives with their own name). We buy the high quality JVC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. Ideal for Schools & Colleges. We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £5. (At Watford we anticipate your needs of tomorrow, not just today!)

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space! your BBC, Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with Watford plinths. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5 1/4" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.



Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
200K (360K)	CLS 200 £90		CS 200 £102	
400K (720K)	CLS400S £92	CLD 400 £175	CS 400S £103	CD400 £196
800K (1.44M)		CLD 800S £179		CD 800S £198

● TWIN Disc Drive Case, complete with Power Supply & Cables £43
Securicor carriage on Disc Drives £5 to £6

Prefix **C** = Cased Drive
L = Less PSU
S = Single
D = Double

e.g. **CLS400S** = Cased Disc Drive, Less power supply unit, single 5 1/4" 400K, (720K in double density); Double sided; 40/80 track switchable.

Suffix **S** = 40-80 Switchable

Cable to connect 5 1/4" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3 1/2" and 5 1/4" Disc Drives
simultaneously to the BBC Compact £13

3M - DISKETTES

3M - SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor.

● 10 x 5 1/4" S/S D/D 40 Track Diskettes	£9
● 10 x 5 1/4" D/S D/D 40 Track Diskettes	£11
● 10 x 5 1/4" S/S D/D 80 Track Diskettes	£13
● 10 x 5 1/4" D/S D/D 80 Track Diskettes	£13
● 10 x 5 1/4" 1.6M D/S D/D High Density Discs for IBM XT and AT	£28
● 10 x 3 1/2" S/S D/D 40/80 track Discs	£18
● 10 x 3 1/2" D/S D/D 40/80 track Discs	£22

TOP QUALITY 3 1/2" & 5 1/4" DISKETTES

To complement the range of quality discs and disc drives that WE already sell, WE are now supplying some special offer packs of 10 high quality discs. Each Disc has a reinforced hub ring and carries a lifetime guarantee. These are supplied complete with selfstick labels and packaged in an attractive plastic library disc box to protect them from damage. We strongly recommend these Discs.

DON'T SETTLE FOR LESS, BUY THE BEST

● 10 x M3 3 1/2" D/S D/D 80 Track Discs	£18
● 10 x M4 5 1/4" S/S D/D 40 Track Discs	£7
● 10 x M5 5 1/4" D/S D/D 40 Track Discs	£9
● 10 x M7 5 1/4" D/S D/D 80 Track Discs	£11
● 3" Double Sided Discs	£3 each

Special BULK OFFER on 5 1/4" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
● Without Sleeves	£35	£39	£45
● With Sleeves	£38	£42	£48

ACORN WINCHESTER DRIVES

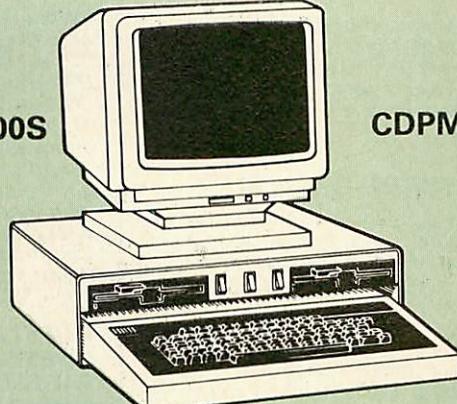
Supplied complete with Level 3 Econet File Server software.
20 Megabytes £699; 30 Megabytes £1549



WATFORD's WINCHESTER DRIVES

● 10 Megabyte Unit with ADFS	£399
● 20 Megabyte Unit with ADFS	£499
● 40 Megabyte Unit with ADFS	£999

CDP 800S

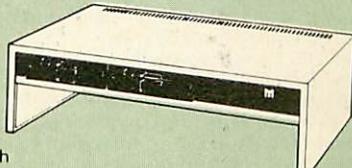


CDPM 800S

Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The switches are mounted on the front panel for ease of use.

CDP 800S for BBC Micro £119 CDPM 800S for Master £205
(Securicor Carr. £7)

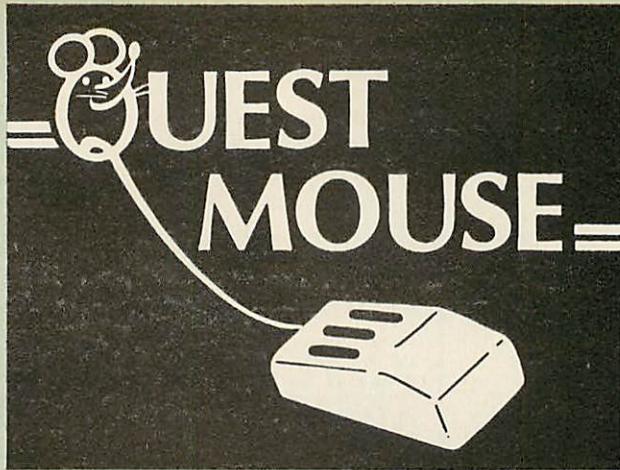
ACORN'S Twin 800K Disc Drives



Specially mounted side by side in a Master Plinth. Supplied complete with Cables. Plugs directly to the Master Computer.

RRP £250 Our Price: Only £189 (carr £7)

NOMINATED FOR



QUEST MOUSE

The ultimate in Mouse technology, the Watford Electronics Quest Mouse must be the most powerful Mouse package yet produced for the BBC Micro. Featuring state of the art 32K ROM software the Quest Mouse package is filled with features essential to the budding artist. The Quest Mouse is a high precision, low profile and large footprint mouse. It has three large comfortable buttons and is smooth and easy to use on most work surfaces. The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that programs such as AMX Pagemaker etc, will work with it.

The two parts of the Quest package are available separately so that existing Mouse owners can upgrade to the Watford's sophisticated Quest Paint software or replace their existing worn out mice for a minimum cost.

QUEST PAINT

The Quest Mouse software is supplied on a PALPROM unit to allow the sophisticated 32K program to be used from a single ROM socket. It is compatible with the BBC B, BBC B Plus and BBC Master Series machines.

The software is used to draw high resolution Mode 1 pictures in full colour. All menu selection and control of the drawing process is performed with the mouse so that you will hardly ever touch the keyboard.

SOFTWARE FEATURES

The software is far too powerful for us to describe it fully in such a small space. Below is a list of the various features. Please write to us for a fully descriptive leaflet.

Disk interface not required. Utilities disk has facility to create and print big screens. Colours applied can be solid, either pattern or user defined pattern. Drawing can use brush or airbrush. Brush shapes can be defined and stored. Airbrush sprays colour/pattern randomly with four jet sizes and even or center spread. Colour cycles. Colour protection to stop particular colours from being overwritten by selected drawing actions. All standard drawing facilities like: rubber, straight pencil lines, triangles, circles, ellipses, rectangles, parallelograms, polygons, etc are provided. All shapes can be solid or just a boundary line. Once a shape has been set up it can be repeated anywhere on the screen. Global colour replace in a rectangle. Powerful fill facility for areas and vertical/horizontal lines. Full cut and paste of rectangular areas with rotation and size with screens from Watford Beeb

Video digitiser. Load and Save screens with colour pallet information, save brush and pattern definitions etc.

Take The Guesswork Out of Selecting a Mouse Package
With reviews like this how can you go wrong.

Popular Computing Weekly, 9-11 June '87
"What you actually get for your money is a well built, three button mouse (far superior to the AMX mouse)."
"Overall the combination of a quality mouse and decent art package gives Watford Electronics a real chance of supplanting AMX as mouse supremos."

Micro User June '87
"Quest Mouse and Quest Paint can hold their heads high in the market..."

A&B Computing June '87
"... Watford Electronics, a company famed for excellent hardware add ons and versatile software packages. Called Quest mouse, "this is a very special mouse driven drawing package..."

"... you will have one of the most comfortable and professionally built mice I have used in a long time. The buttons are responsive, the mouse movement is smooth and without directional bias - a pleasure to use."

"What we have here is probably the best art package there is for the BBC Micro..."
"Quest Paint is a major leap forward in BBC programming..."
"Quest Paint is an original piece of programming, it is friendly and well endowed with many useful facilities. I would comfortably say it is easier to draw good pictures with Quest Paint than it is with more expensive 'Professional' art packages for the Atari ST and the Commodore Amiga. A recommended buy if you are looking for the best in BBC micro based art packages".

QUEST MOUSE & QUEST PAINT £55
QUEST MOUSE, QUEST PAINT, AMX PAGEMAKER & PAGEFONT £85
QUEST MOUSE ONLY £29
QUEST PAINT SOFTWARE £32
QUEST FONT DISC £12
QUEST MAT £3

Part-exchange your old Mouse for a New QUEST MOUSE for only £23

N.B.

1. Quest Paint supplied complete with Software in a 32K ROM, Comprehensive User Guide and a Utility Disc.
2. Quest Font Disc has 24 text FONTS for use within Quest Mouse.

P.S. There is no need to worry about any of your existing AMX mouse software. The Quest Mouse is totally AMX compatible so it will work with any of the AMX range of software.

All prices in this advert are exclusive of VAT.

MARK II LIGHT PEN + PENPAL 2

Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted.

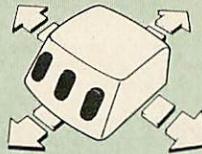
Penpal II, Watford Electronics' sophisticated light pen software is also supplied free on cassette or disc (please specify). This is a highly sophisticated drawing package enabling you to gain the maximum benefit from your Light Pen. The software is used to edit Mode 2 full colour screens using lines, patterns and your own designs. Screens may be saved to cassette or disc.

Price Only £18



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

THE AMX MOUSE



Now supplied with the NEW SUPERART Software ROM & Disc at no extra cost.

ONLY: £59 (carr £1.50)
(Please specify for BBC or Master Computer)

We are giving away, absolutely FREE, our popular Colour Art software package worth £15 with every AMX Mouse package purchased from us.

AMX MAT	£3
AMX MOUSE ONLY	£29
AMX DESK Package	£19.00
AMX UTILITY Package	£11.00
AMX SUPERART Package	£39
AMX PAGE-MAKER Pack - A desk-top publishing software. It Works with keyboard, joystick and a mouse	Only: £32

We are giving away, absolutely FREE, PAGE-FONTS, a disc containing over 20 fonts, with every purchase of AMX PAGE-MAKER from us.

PAGE-FONTS Over 20 fonts for use with

AMX PAGE-MAKER	£9.50
EXTRA EXTRA	£19
AMX DESIGN (ROM)	£59
AMX 3D ZICON Disc	£19
AMX Database Disc	£19
AMX XAM Educational	£19
AMX MAX A gem of desktop (ROM)	£17

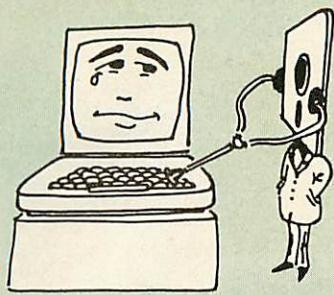
RB2 MARCONI TRACKER BALL

Complete with Software Disc
RB2 + Software Disc + Quest Paint

FLEET STREET EDITOR

Software pack	£35
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULA's, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and 280 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

BBC SOFTWARE'S Popular Educational Software

● Maths with a Story 1 (Cassette)	4 primary level maths programs	£9.95
● Maths with a Story 2 (Cassette)	4 further maths programs	£9.95
● Picture Craft (Disc)	6 - 14 age group. Pack consists of flexible geometrical design & colouring programs	£19.95
● WAVES: Science Topics (Disc)	CSC O Level Physics program.	£14.95
● RELATIONSHIP: Science (Disc)	O Level Biology program.	£14.95
● BONDING: Science (Disc)	O Level Chemistry program.	£14.95
● ELECTROMAGNETIC SPECTRUM (8 Discs)	O Level program.	£14.95
● ELECTRONICS IN ACTION (Disc)	O Level program	£14.95
● NEWTON & THE SPACE SHUTTLE (Disc)	O Level program.	£20
● ECOLOGY (Disc)	O Level program.	£20
● POLYMERS (Disc)	O Level program.	£20
● Clasification & Periodic Table	O Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.	£20
● FOOD & POPULATION (Disc)	O Level program.	£20
● MICROTECHNOLOGY (Cassette)	O Level program.	£6.95
● A VOUS LA FRANCE (2 Cassettes)	A French language home study aid.	£17
● DEUTSCH DIREKT! (Disc & Audio Cassette)		£20
● Modem Master (Disc)		£11.25
● ADVANCED TELETEXT SYSTEM		£6.90
● PERIOD TABLE SOFTWARE		£20
● USING YOUR COMPUTER (Cassette)	8-12 age	£24

TED

THE ULTIMATE TELETEXT SYSTEM

TED is one of a new generation of powerful 32K ROMs for the BBC B, B+ and Master computers and is compatible with disc, tape and network systems. It is in everyday use in schools, colleges and universities, Programmers, Prestel I.P.'s, Micronetters and exhibitors have also found it indispensable.

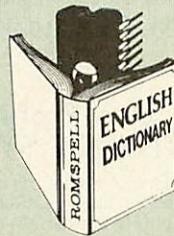
TED includes the most comprehensive teletext (Mode 7) screen editor ever written for the BBC micro, combining flexibility with ease of use. Its sophisticated facilities include line, column and block copying within AND between frames; text, in a variety of styles and sizes, entered directly from the keyboard; graphics and line drawing modes; search and replace; margins; printer dump routines and a library of in-built icons and typefaces. TED will edit ANY mode 7 screen and can even convert high-res graphics screens to mode 7! Included within the ROM is a fully Epsom compatible mode 7 graphics dump routine giving a grey scale printout of exactly what appears on the screen.

Using "SHOW" (a versatile carousel), collections of mode 7 screens may be 'routed' or displayed sequentially, making it ideal for creating and running "Viewdata" information systems. Over 1200 frames may be stored on a twin 80 track drive. A unique feature of TED is "SCROLL", which lets you create pages of up to 600 lines which may be viewed "Wordwise style", automatically or manually. SHOWs and SCROLLs may be freely mixed and even used from within a BASIC program.

The package comprises a 32K ROM, a 117 page manual, a function-key strip and a demonstration disc containing examples of real-time animation and a sample 55-frame database. A stand-alone machine code routine is provided allowing SHOWs and SCROLLs to be displayed on machines not fitted with TED.

Price: £35

ROM-SPELL

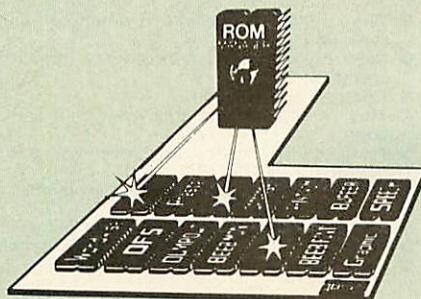


Probably the most advanced and fastest spelling checker available for the BBC Micro. Compatible with View, Wordwise and Wordwise Plus ROMSPELL is simple to use with easy editing of incorrect words. Full facilities for editing the user dictionary to allow customisation to your personal needs. Dictionary includes over 30,000 words and is supplied with a Comprehensive manual.

NOT compatible with 1770 DFS.
(Please state 40 or 80 track disc)

Price still only: £25

ROM MANAGER

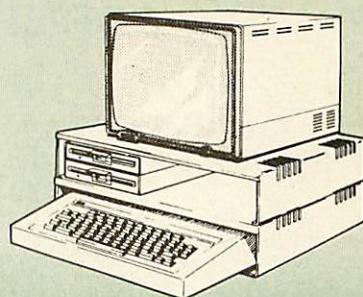


Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

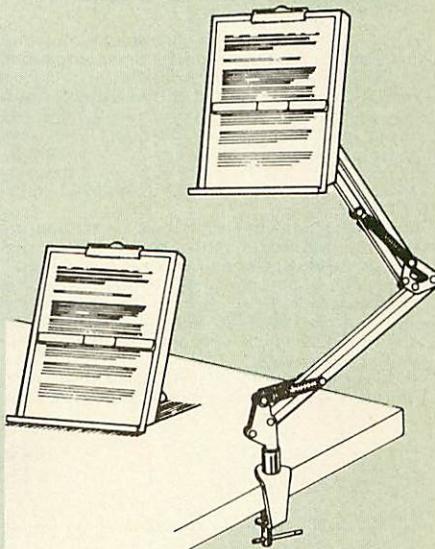
PLINTHS FOR BBC MICRO, MASTER & PRINTERS



Protect your computer from the weight and heat of your monitor. The BBC micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and monitor, whilst the double height version provides enough room for our stacked or side-by-side dual disc drives or TORCH Disc pack, to be placed in the centre section. If you use our stacked drives, the remaining space can be used for further peripherals e.g. Speech Synthesizer, EPROM programmer or simply stationery. The computer slides neatly in to the lower section allowing easy access to remove the lid. The printer plinth is equally sturdy but without the cooling slots. It allows for access to the paper from the front as well as from the rear, (a facility not often thought of in similar products) if the paper is located beneath the plinth. This is a very convenient way to work especially if your work area is not deep enough to take the printer and paper separately.

SINGLE BBC PLINTH	£11 (carr. £1.50)
DOUBLE BBC PLINTH	£20 (carr. £2.00)
PRINTER PLINTH	£10 (carr. £1.50)
SINGLE MASTER PLINTH	£14 (carr. £1.50)
DOUBLE MASTER PLINTH	£25 (carr. £2.00)

COPY HOLDERS



How often have you been about to type hand written notes into your computer when you find that there's nowhere to rest the paper or that your notes are resting at the wrong angle to read the type? Whether the notes be your latest program or the draft of a new trilogy, the new Manuscript Holders from Watford are superb for holding your paper at the ideal height and angle to allow you read and type in ease and comfort.

Available in 2 versions, desk resting and shelf clamping versions, these two units hold your paper firmly by means of a plastic retaining ruler and a clip grip. Both units are full A4 size.

Amazing value at only
Desk Top £10 (carr. £2)
Angle poise £14 (carr. £3)

Continued →



ARIES CORNER

The Aries B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Comal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved "FX call".

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro - no flying leads to connect and no soldering. Provision of the on-board ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

Price: £80 (carr. £2)

Aries B-12 Sideways ROM Board

This board is extremely well made, simple to install, reliable when fully loaded and compatible with the Aries-B20 and the Aries-B32.

The B12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

The B12 system consists of two parts: a large detachable "mother board" which carries the extension ROM sockets and a small "base board" on a short ribbon cable, which plugs into the existing sideways ROM sockets. This two-board design eliminates the reliability problems previously associated with some other ribbon-cable based systems.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost.

Price: Aries B-12 £40
Aries B-12C £5

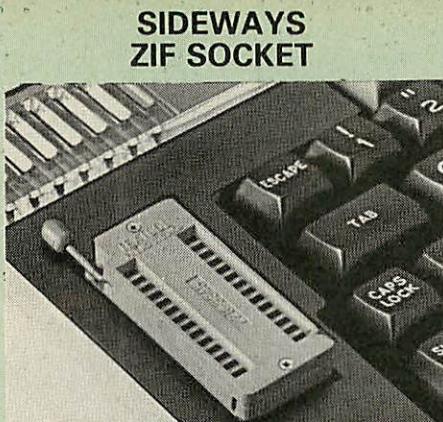
ARIES B-488 IEEE-488 INTERFACE UNIT

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP-IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

GRAPH PAD 2

Supplied complete with Software
£60 (Carr. £3)



SIDeways ZIF SOCKET

Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for all professionals and Hobbyists alike.)
- BBC, B+ and Master compatible.

ONLY £15 (carr £2)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack.

● Complete System	£11
● Spare Cartridges	£2.50
● Spare Rack	£1.50

16K Sideways RAM Modules

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances).
- Read protection (allows recovery from ROM crashes).
- Compact construction.
- May be fitted in systems even with a ROM board.
- Multiple units may be fitted, even with a ROM board.
- No overheating or overloading problems.
- Free utilities disc supplied.
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

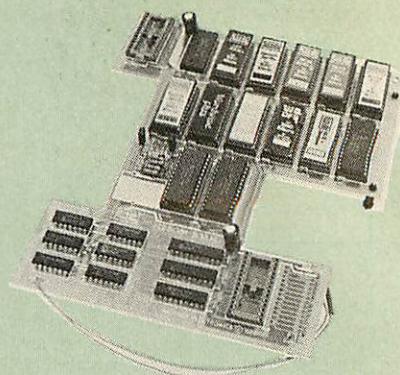
Only: £24 (carr £2)

Optional extras

READ and WRITE protect Switches £2 each
Battery for Battery Backup £3

All prices in this advert are
exclusive of VAT.

SOLDERLESS SIDeways ROM SOCKET BOARD



In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others - not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

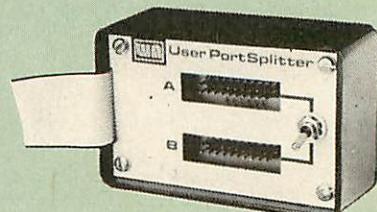
- The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
- Increase your BBCs capacity for ROMs from 4 to 16.
- No soldering required.
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32
Battery backup fitted £36
(carriage £2)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

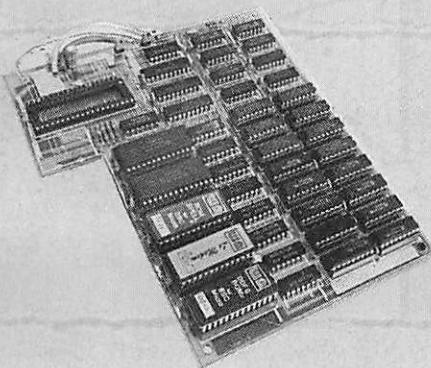
USER PORT SPLITTER UNIT



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination.

Excellent Value at £15

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 3 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO overheating problems.
- No User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with all BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of Battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- Accepts any ROM.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE Fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROM-SPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

Please write in for further details.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM £39
- ROM/RAM card with 64k dynamic RAM £52
- ROM/RAM card with a massive 128k dynamic RAM £80

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit £6
- 16k Dynamic RAM for Upgrade £7.50
- Battery backup £3
- Read and Write protect switches £2 each
- Complete ROM-RAM board
- All options installed £89

P.S.

Is your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford ROM/RAM Board and pay £10 less

Le Modem



The MODEM from Watford

At last a professional MODEM for the BBC Micro. Unlike other 'Modem packages' this is a complete package there are no extra software costs to get 'up and running'. Of course Le MODEM is multi-standard, i.e. 300/300, 1200/75 & 75/1200 UK and BELL (USA) are all supported.

The features that make Le MODEM such good value are:

- A complete communications terminal that transforms your BBC Micro into a very powerful World-wide data transfer system.
- Auto Dials, Auto answers, and is completely controlled by your micro. There are no external controls!
- Allows you to access PRESTEL, B.T. GOLD, THE SOURCE, MICROLINK, MICRONET, MICROWEB, THE TIMES NETWORK, MICRO LIVE (BBC TV database), CITY BB and more.
- Designed to be SIMPLE but SOPHISTICATED. To LOGON to a data base all you have to know is its TELEPHONE NUMBER, Le MODEM does the rest.
- Supplied with a comprehensive telecomm package in a 16K sideways ROM which includes a FULL PRESTEL terminal allowing TELE-SOFTWARE to be downloaded.
- A comprehensive 80 column terminal. This includes XMODEM error checked transfer protocol, to allow error free data transfer anywhere in the world!
- FULLY controlled by simple *COMMANDS allowing you to control it from your own BASIC programs. To get you started we supply a FREE disc of bundled software!
- Connects to the 1MHz bus. A *AUDIO ON-OFF command allows you to actually hear the telephone line through your BBC micro loudspeaker.
- Completely self contained with internal mains power supply. (Even a free mains plug is fitted!) A *TEST facility gives ON SCREEN indication that Le MODEM is working correctly.
- Packaged in such as way that you need nothing else except a BBC Micro to communicate with computers all over the world.
- FREE Registration to MicroLink.
- BT Approval applied for.

(When ordering, please specify the version required, (BBC or Master)

SPECIAL OFFER

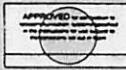
Price: £74
(carr £3)

(Price includes, Le Modem, Software ROM, Cables & Comprehensive Manual)
(Write in for further details)

Nightingale Modem

SPECIAL PRICE to our Customers

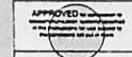
£82



(Price includes: Nightingale Modem, Commstar ROM pack & Comprehensive manual)

Nightingale Modem without software Only £75
COMMSTAR ROM package only £29
(P&P on modem £3.00)

APOLLO



The NEW Modem from Watford

Following numerous requests from you, our discerning customers for an APPROVED, Low Cost & High Performance modem with Auto Dial & Auto Answer facilities as standard we bring you the versatile APOLLO Modem. Just compare the features and look at the price (which incidentally includes the cost of the Software, manual and BBC connecting cable). We are sure you will agree that Watford Electronics in their traditional way are giving you a super 'value for money' deal.

Just look at these features:

- V21 for Bulletin boards, Microlink, Telecom Gold, etc.
- V23 for Prestel, Home Banking, and other Viewdata services.
- Reverse V23 allows User run Viewdata service.
- 1200-1200 half duplex for communications.
- XMODEM, HEX and ASCII file transmission.
- Auto Dial of given 'phone number.
- Auto Answer for User's Bulletin Board.
- 80 column terminal with split screen facility.
- Prestel text screen dump.
- Fully BART approved.
- FREE Registration to MicroLink.

The Apollo is attractively finished in matt black. It opens the doors to world communication to both, the Hobbyist and the Professionals alike. With baud rates varying from 300/300 Originate and Answer, 1200/75 and 75/1200 full duplex and 1200/1200 half duplex, virtually all the popular tele-services can be accessed. A comprehensive Comms ROM oversees the use of the APOLLO, providing simple commands for all the software controlled facilities. APOLLO is an ideal modem for both the first time buyer and the seasoned user. Join the Telecommunications Revolution – Buy a Watford APOLLO!

Only: £75 (Carr £3)
(Write in for full specification)

Minerva Systems Software

System Delta with Card Index	£55
System Programmers Ref. Guide	£19
System Gamma	£43
System Gamma Prog. Ref. Guide	£19
System Mailshot	£17
System Reporter	£17
System Inter/View Link	£17

Versatile BEEB SPEECH SYNTHESISER Unit



The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £2)

Continued →

**COMPUTER CONCEPT'S
ROMS**

ACCELERATOR	£48
CARETAKER Basic Utility	£25
DISC DOCTOR	£28
Graphics ROM	£23
TERMI	£25
COMMUNICATOR	£49
SPEECH ROM	£24
Printmaster	£24

Wordwise

£24

Wordwise plus
WORDWISE PLUS
£40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid
**The most comprehensive
utilities ROM
for Wordwise-Plus**

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear text-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc Interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £47

Inter SHEET ONLY £37

**INTER-
CHART** ONLY: £26

Inter-WORD

Only: £39

INTERBASE £55

All Prices Exclusive of VAT

VIEW
VIEW WORDPROCESSOR 2.1 £37

VIEW 3.0 ROM £54

VIEW PROFESSIONAL £79

HI-VIEW £36
(for use with 6502 2nd Processor)

VIEW Printer Driver Generator £9
Please specify Disc or Cassette)

VIEWSHEET (Acornsoft) £37

VIEWSTORE £37

VIEWSPELL with 80 track disc £29

VIEWPLOT Disc £22
(Please specify for Master 128 or Compact)

VIEW-INDEX £12

**OVERVIEW Packs 1 & 2 for the
Master** £75

**Watford's own Sophisticated
VIEW PRINTER DRIVERS**

Epson FX80 & Kaga KP (Disc)	£8
Juki & Brother HR15 (Disc)	£8
Silver Reed Printers (Disc)	£8

Micros in Business (Disc)
An introduction to Business software
for the BBC Micro from Acorn £43

**ADVANCE COMPUTER
PRODUCTS' ROMs**

Adv. Disc Toolkit	£29
Adv 1770 DFS for Mast/Compact	£29
Adv 1770 DFS for BBC/BBC+	£29
Adv Disc Investigator	£24
Adv. Control Panel	£29
Adv. Rom Manager	£13

MINI OFFICE II

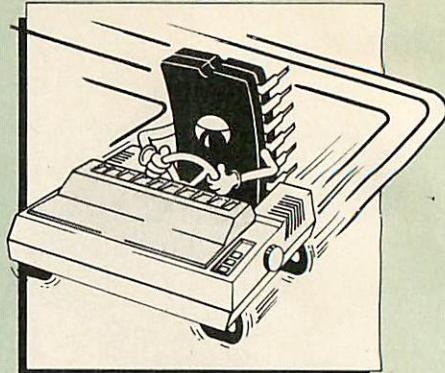
Disc Version	£14.50
ROM Version	£48.00

REPLICA 3

This new improved REPLICA 3 from Clares is a very powerful disc based TAPE to DISC Utility. It now transfers even more programs than ever before. Replica 3 will not work with all programs but then neither will anything else. 30,000 Replicas have been sold to date. It has to be good.

£13 (40 or 80 track)

**Acorn's Speech Synthesiser
package, complete**
Special Offer £18

**VIEW PRINTER DRIVER
ROM**


View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing only at a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, H180, KP810/910, PW1080, JP101, HR15, M1009, GLP, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

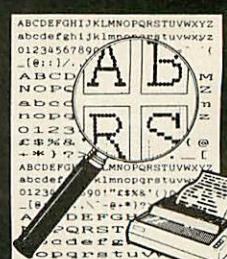
NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute * command when printing.

Other features include a very powerful on screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

EPSON NLQ ROM

for the BBC Micro



Harness the full potential of your Epson RX or FX printer. The NLQ ROM makes Epson printers produce Near Letter Quality output with optional proportional spacing, enlarged and underlined. Accessed by simple * commands from Basic, Wordwise and View (with driver) or almost any other language.

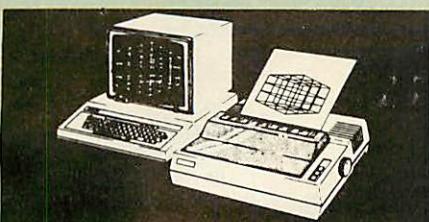
(Send an SAE for sample printout)

Only: £25

VIEW PRINTER DRIVER for NLQ ROM

£7

DUMPOUT 3



A highly sophisticated screen dump ROM. This has to be the most flexible and powerful screen dump ROM yet produced for the BBC micro. It will put on paper anything you see on the screen, including full Mode 7 graphics. Also provided are window setting utilities and OSWORD calls to plot and read Mode 7 graphics pixels.

Facilities:

- Vertical and horizontal scaling in all graphics modes and mode 7
- Rotation of image by 90, 180 or 270 degrees
- Left hand margin setting
- Screen dump window setting
- Colours appear as grey scale
- Two tone fast dump
- Colour mask
- Mode 7 contrast expansion
- Mode 7 contiguous dump
- Key triggered and User Port triggered dumps

The Micro User Feb. 1985.
Without reservation I wholeheartedly recommend the Dump Out 3 ROM as the ultimate screen dump facility for the BBC Micro ... it must represent excellent value for money and surely cannot be beaten".

For use with the following printers:

GLP, GP80/100/250, CANNON, STAR, KAGA/TAXAN, NEC, SHINWA CP80, GEMINI, EPSON MX/RX/FX, M1009, NEC PC8023, DMP100/200/400, Panasonic KX1080, Mannesmann Tally and compatibles.

Only: £25

(Write in for further details on all above ROMS)

THE EUREKA CARD

(The Unique RAM Expansion System)

The Eureka Card is Watford's latest and most sophisticated RAM expansion system. Using advanced PAL based technology this card is a breakthrough in RAM systems for the BBC micro. The Eureka Card provides the user with around 58K of free memory in Basic, VIEW and WORDWISE PLUS. You also get Shadow RAM from within the active language. No other RAM expansion system can match that!

Load up to 58K long Basic programs. Texts in VIEW and WORDWISE PLUS up to 58K as well. This with absolutely NO loss of speed in accessing your text or program. Eureka consists of a card containing 64K of program memory, two parallel banks of sideways RAM and some extremely complex switching circuitry. This is all controlled by Eureka's highly sophisticated software supplied in ROM. Designed to a very high specification, this board is fully buffered to give reliable operation under virtually any circumstances.

The Eureka board plugs into the 6502 socket and has NO messy flying leads. It is compatible with many other products from Watford, such as our Solderless ROM Board and our ROM/RAM Board. All in all, the Eureka Card is an amazing board. Jump into the age of serious data processing with a Eureka Card! Please write in for further details on advantages the Eureka can offer you.

Introductory price: Only £89 (carr £3)

(P.S. Eureka is only suitable for a standard model B; it normally replaces any Shadow RAM cards present. Some speed degradation does occur with filing system access. Eureka cannot be used at the same time as a second processor).

BEEBMON

The most powerful machine code monitor for the BBC Micro £24.

THE NLQ DESIGNER

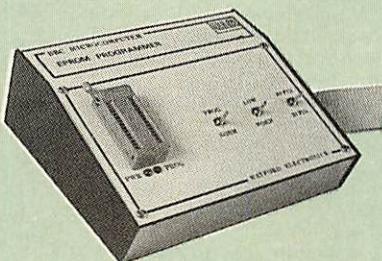
(The First & still the Best)
Supplied with over 25
Different fonts

A massively useful utility for users of the Taxan/Kaga KP810/910 or the Canon PW1080. This program allows you to define NLQ character sets to download into the printer's memory. Full on screen editing of the font. Requires 6264 RAM chip to be fitted in the printer.

Supplied with disc containing over 25 example fonts. Please specify 40 or 80 track. Fonts are: Italic, Courier, Courier Italic, Script, Copper Plate, Shadow, Bold, Double Print and Gothic etc. (P.S. This ROM is not suitable for Epson printers.)

● NLQ Designer ROM & FONT Disc £25

ADDER



Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.

The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.

The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: From 2K to 32K: 2516, 2716, 2532, 2732, 2764, 2764A, 27128, 27128A, 27256 (Both 12.5V and 21V).

£65 (£3 Carr)

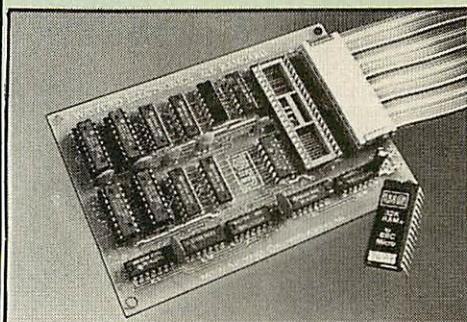
TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** - Standard version erases up to 16 chips. £28 (carr £2)
- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. £30 (carr £2)
- Spare UV tubes. £9

32K

SHADOW RAM- Printer Buffer Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16K or even 20K, but a massive 32K of extra RAM!!!

● IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

● "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.

● In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24K of text in memory. This product is recommended as an ideal complement by Computer Concepts.

● Combine GOOD.GRAPHICS and LONG PROGRAMS. Use the top 20K of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28K of program space.

● Use the FULL 32K or the bottom 12K of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS423 etc. Print large text files while running long graphics programs, and have all your buffer options available as well. (*FX15,21,138,145,ADVAL etc). Please note only a 12K printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

● Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

See next page for SPECIAL OFFER

Only £59 (carr £2)

(Price includes a comprehensive manual and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32K SHADOW RAM CARD and Computer Concepts' INTERWORD Wordprocessor package.

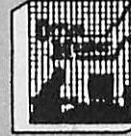
at Only £89 (carr £2)

Continued

BOOKS (No VAT on Books)

30 Hour BASIC (BBC Micro)	£7.95
40 Best machine Code Routines	£7.95
50 Programs in BBC BASIC	£6.95
6502 Assembly Language Program	£19.95
6502 Application	£11.95
6502 Assembly Lang. Subroutines	£19.95
6502 Development Package	£7.50
6502 Reference Guide	£9.95
68000 Assembly Lang. Programming	£19.95
68000 Machine Code Programming	£13.00
68000 Microprocessor Handbook	£14.95
68000 Programming the	£22.95
68000 User Guide	£8.95
6809 Programming the	£16.95
6809 Machine Code Programming	£7.95
8086/8088 Assembly Language Prog.	£11.95
8086/8088 Programming the	£16.95
Advanced Disc User Guide	£16.95
Advanced BASIC ROM User Guide	£9.95
Advanced Programming Guide to BBC	£9.95
Advanced Sideways RAM User Guide	£10
Advanced User Guide for BBC	£10.95
Advanced FORTH	£9.95
Advanced Graphics with BBC	£9.95
Assembly Language Programming on BBC Micro	£11.50
Adventure into BBC BASIC	£6.95
Applied Assembly Lang. for BBC	£9.95
ARM Assem, Lang. Programming	£12.95
Art of Microcomputer Graphics	£14.95
Assembly Language Programming FOR the BBC Micro	£8.95
Assembly Language Programming on the BBC & Electron	£8.95
Basic ROM User Guide	£11.95
BBC BASIC Compendium	£5.95
BBC BASIC for Beginners	£7.95
BBC Forth	£7.50
BBC Hardware Projects	£8.95
BBC Micro & the Small Business	£5.75
BBC Micro ROM Book	£10.95
BBC Master 128 for High Flyer	£10.95
BBC Micro Disc Companion	£8.95
BBC Software Projects	£6.95
BCPL User Guide	£14
BCPL The Language & its Compiler	£7.95
C for Beginners	£10.95
C for Programmers	£9.95
Complete FORTH	£6.95
Computer Graphics & CAD Fundamentals	£9.95
CP-M-86 User's Guide	£19.95
CP-M Bible	£16.50
CP-M Handbook with MPM	£9.95
CP-M Plus Handbook	£13.95
CP-M Soul of	£16.50
CP-M The Software Bus	£8.95
Creative graphics on BBC Micro	£7.50
Disc Drive Projects for Micros	£5.45
DISC FILING SYSTEM (DFS) Operating Manual for BBC	£6.95
DBASE Programming Language	£14.95
Disc Programming Techniques	£9.95
Exploring FORTH	£6.95
FORTH on the BBC Micro	£7.50
Functional Forth for the BBC Micro	£5.95
Guide to BBC ROMs	£9.95
Graphics for Children	£6.95
Graphs & Charts on BBC Micro	£7.50
Hackers Handbook - New	£6.95
Inside Information (Computers, Interfacing & Control of BBC Micro Communications & People)	£9.95
Interfacing & Robotics on BBC	£8.95
Introduction to COMAL	£15.95
Introduction to LOGO	£9.50
Introducing 'C'	£6.95
Introducing LOGO	£9.95
Introduction to FORTH	£8.95
Introduction to PASCAL	£17.95
ISO-PASCAL Reference Manual	£9.95
LISP 2nd Edition	£14.95
LISP, A Beginners Guide to	£10.95
LISP on the BBC Micro	£7.50
LISP The Language of Artificial Intelligence	£9.95
Logo on the BBC Micro	£7.50
Logo Programming	£9.95
Mysteries of DISC DRIVES and DFS REVEALED	£5.95
Mastering Assembly Code	£8.95
Mastering CP-M	£17.95
Mastering Music	£6.95
Mastering the Disc Drive	£7.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14.00
Master Reference Manual Part 2	£14.00
Mastering View, Viewsheet & Mathematical Progress in BBC Basic	£7.95
Micro Prolog	£10.00
Microtext for the BBC	£10.00
Viewstore	£12.95
Points of View	£6.95
Practical Disc File Techniques	£5.95
Programming the 6502	£16.95
Programming the Z80	£19.95
Structured Basic	£7.95
The Epson FX-KAGA PRINTER Commands REVEALED	£5.95
The Software Business	£5.50
Toolbox 2	£10.95
Towers Int. Transistors Selectors	£12.95
Turtle Graphics on BBC Micro	£7.50
Understanding FORTH - A Beginner's Guide	£6.50
Understanding Interword - A Beginner's Guide	£6.50
View 3.0 User Guide	£10
View Guide	£4.50
VIEW incl. ViewSpell & ViewIndex	£12.95
Viewsheet User Guide	£10
Viewstore User Guide	£10
Within the BBC Micro	£13.95
Writing Interactive Interpreters & Compilers	£8.45
Wordprocessing BBC Beginners Guide	£7.95
Wordstar & CP/M made easy	£7.45
Wordwise + A User Guide	£9.95
Z80 Applications	£15.95
Z80 Assembly Language Programming	£19.95
Z80 Reference Guide	£9.95

OFFICE MASTER



CASHBOOK - A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS - Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST - A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

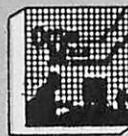
EASILEDGER - A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS - Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL - Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only £21 (Disc)

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

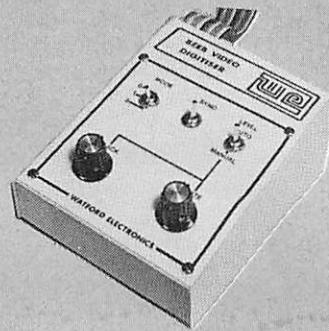
DATABASE - Set up a computerised card index system with powerful search facilities.

SPREADSHEET - Offers many calculation and editing features.

BEEBPLOT - Provides visual representation from Spreadsheet data.

OFFICE MATE Only £10 (Disc)

BEEB VIDEO DIGITISER



Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional * commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROM's to work on it.

A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image.

Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £3)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual (BBC B+ and Master compatible, except Master with Econet)

Magazine Maker

(As seen on TV)

A combination of the AMX Pagemaker and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within AMX Pagemaker to illustrate magazines or newsletters - in fact anything that needs to be created on A4 size paper.

With Pagemaker's many features, a variety of pictures can be composed - the only limit being the imagination.

Pictures can be doctored using Pagemaker's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definers, text formatting and the ability to load in wordwise and viewfiles plus much more.

Once created the picture can be printed out. The Magazine Maker is suitable for any use that requires illustrated documents.

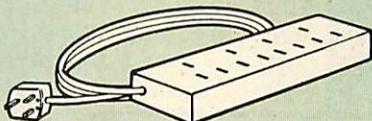
Complete Package £129.00 (carr. £3)

SURGE PROTECTOR Plug

Fitted in place of your normal mains plug, this device protects your equipment against mains surges. Nearby lightning strikes, thermostats switching and many other sources which put high voltage transient spikes on to the mains. This can lead to data corruption in memory and on disc and can result in spuriously crashing machines. A must for every computer user.

Protection for only £6.99

4 WAY MAINS DISTRIBUTION SOCKET



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£7.95 (carr. £1.50)

SPIKES CLEANER UNIT

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete computer system

£12.50 (carr. £1.50)

SPARES for BBC Micro

Keyboard	£46	Keystrip	£2
UHF Modulator	£4	Case	£20
Speaker Grill	£1	Speaker	£2
Power Supply	£59	Keyswitch	£1.50

Replacement FLEXIBLE 17 way Keyboard Connector £3

8 WAY DIP SWITCHES

With these DIP switches soldered to their keyboard, any BBC B or B+ owner can take full advantage of the fast disc drives that we supply by configuring his BBC for fast disc drive operation.

Excellent value for money at £1.00

CONNECTING LEADS

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug to 5 pin DIN Plug + 1 Jack Plug	£2.00
to 3 pin DIN Plug + 1 Jack Plug	£2.00
to 7 pin DIN Plug	£2.50
to 3 Jack Plugs	£2.00
6 pin DIN to 6 pin DIN Plug (RGB)	£2.50

DISC DRIVE POWER LEADS

Supply from BBC power supply to standard Disc Drive connector.

Single £3.00 Dual £3.75

DISC DRIVE INTERFACE LEADS

BBC to Disc Drives Ribbon Cable Single £4 Twin £6

MISCELLANEOUS CONNECTORS

	Plugs	Sockets	
RGB (6PIN DIN)	30p	45p	
RS423 (5pin Domino)	40p	50p	
Cassette (7 pin DIN)	25p	65p	
ECONET (5pin DIN)	20p	30p	
Paddles (15pin 'D')	80p	—	
BBC Power Plug 6way	80p	200p	
Disc Drive Plug 4way	75p	—	
6way Power Connector	—	95p	

Watford Dealers' List

UNITED KINGDOM

Badger Micros (Devon), Badger's Hill, Southerton, Ottery-St. Mary, Devon EX11 1SE. Tel: 0395 68516.

Beebug Retail, Dolphin Place, Holywell Hill, St. Albans.

Cambridge Computer Store, 4 Emmanuel St., Cambridge CB1 1NE. Tel: 0223 358264.

Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts.

C.J.E. Micros, 78 Brighton Road, Worthing, West Sussex. Tel: 0903 213361.

HCCS, 575-583 Durham Road, Low Fell, Gateshead, Nr. Newcastle Upon Tyne. Tel: 091 4870760.

Mancomp Ltd, Printworks Lane, Levenshulme, Manchester. Tel: 061-224 1888-9888.

Microman Computers, Rainford Industrial Estate, Mill Lane, Rainford, St. Helens

The Computer Depot, 205 Buchanan Street, Glasgow G1 2JZ. Tel: 041-332 3944.

Verospeed Ltd, Boyatt Wood, Eastleigh, Hants.

OVERSEAS DEALERS

*Absolute Electronics, Rewal House, 208-210 La Trobe Street, Melbourne, 3000, Victoria, Australia. Tel: (03) 663 2411.

Alpha Computer Co, Shop 314 Chi Fu Commercial Centre, Chi Fu Fa Yuen, Hong Kong, Tel: 5-506592.

Computer Distribution Company, Parklaan, 47, B-9300 Aalst, Belgium.

E.B.N., Elisenstrasse 13, 1000 Berlin 41. Tel: (030) 7952057

Lendac Data Systems, Unit 31, IDA Enterprise Centre, Pearce Street, Dublin 12. Tel: 710796.

Scientex P.V.B.A., Zilversmidstraat 2, B-2000 Antwerpen, Belgium, Tel: 03 233 59 06

Techno-matic Data, Holbergsgade 19, 1057 Kobenhavn K, Denmark

*Velobyte, Scheadyksadyk 5a-6a, 3011 EB Rotterdam, Holland, Tel: (010) 413 8197/414

Viking Tecno, Vestergade 12.1, 9620 Aalestrup, Denmark, Tel: 08 642522

*Acorn/Watford Referral Centres.

Viglen Console Unit

Enhance the appearance and convenience of your BBC Micro & Master with the Viglen console unit.

BBC £42; Master £51 (carr. £4)

VOLTMACE JOYSTICKS

Delta 3B Single Joystick	£12
Delta 3B Twin Joysticks	£17
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£12
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7

ROM EXTRACTION TOOL

This extremely useful tool allows you trouble free chip removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

£2

ATTACHE CARRYING CASE for BBC Micro

This attache carrying case is attractively finished in mottled antique brown leatherette. An ideal and safe way of carrying your BBC Micro around. Supplied with two Keys. Price: £13 (£2 carr.)

28pinZIFSOCKET (Textool) £6.95

28pin DIL HEADER PLUG
SOLDERtype £1.50
IDCCRIMPtype £1.95

CHIP SHOP ASSORTED ROMS

8271	£36.00	ACORN ADFS	£25
DS3691	£3.50	ACORN BASIC 2	£19
DS88LS120	£5.25	Acorn BCPL	£42
LM324	£0.45	Acorn COMAL	£38
SN76489	£5.50	ACORN DNFS	£17
SAA5050	£8.75	Acorn FORTH	£32
UPD7002	£4.40	Acorn Graphics	£25
2764-250nS	£3.50	Acornsoft C	£74
27128-250nS	£3.75	Acorn LISP	£35
27256	£4.20	Acorn LOGO	£49
27512	£9.50	Acorn OS B+	£25
27C101G (1 Meg)	£20.00	Acorn OS 1.2	£14
4013	60p	Basic Editor	£24
4020	£0.90	Beebfont	£25
4464-12	£4.45	Beebmon	£22
4464-15	£3.75	BROM Plus	£32
4816 RAM	£1.75	Buffer & Backup	£20
41256	£2.45	Communicator	£49
6264LP-8K RAM	£2.80	Graphics Extension Rom	£21
6502A CPU	£4.75	GXR-B	£21
65C02 3M	£9.75	GXR-B+	£22
65C12	£9.00	Help II	£27
6512A	£10.00	ISO Pascal	£54
6522	£3.40	ISO-Pascal Stand	£30
6522A	£5.00	Alone Generator	£28
6845SP	£6.00	ICON Master	£45
68850	£2.95	Logotron LOGO	£34
68854	£7.50	Master Termlator	£62
7438	40p	Micro Prolog	£48
74LS00	25p	Microtext Disc	£48
74LS04	25p	Microtext Rom	£199
74LS10	25p	Mini Office ROM	£47
74LS123	80p	MUROM	£21
74LS163	70p	ROMAS	£29
74LS244	80p	ROMIT	£29
74LS245	£1.00	TERMULATOR	£28
74ALS245	£2.75	Toolkit Plus	£31
74LS373	£1.00	Video ULA	£15
74LS393	£1.00	ULTRACALC	£26
75453	70p	Acornsoft C	£74

Prices subject to change without notice and available on request. ALL OFFERS subject to availability.

Mail Order and RETAIL SHOP. Trade and Export inquiries welcome.

Government and Educational Establishments' OFFICIAL ORDERS Accepted.

Shop Hours: 9.00am to 6.00pm. Monday to Saturday. Thursdays 9am to 8pm. (Free Customer's Car Park)

VAT: UK customers please add 15% VAT to cost incl. carriage.

CARRIAGE: Unless stated otherwise, minimum £1 on all orders. £2 on larger items.

On bulkier items, £7 Securicor charge applies (UK mainland only). Overseas orders, carriage is charged at cost.

Specifications of all products are given in good faith but is subject to change without notice. Some items vary in their availability. Please ring for latest delivery situation.

Watford Electronics

JESSA HOUSE, 250, Lower High Street, WATFORD, ENGLAND
Telephone: (0923) 37774; Telex: 8956095; FAX: 01 950 8989



ACORNSOFT ACORN

AMAZING OFFERS

£££ SAVE £££

FOR ELECTRON

VIEW ROM	£29.95
(Word Processor)	£14.95
VIEWSHEET ROM	£29.95
(Spread Sheet)	£14.95
ACORN PLUS 1	£59.95
NOW IN STOCK!	£49.95

ELECTRON COMPUTERS
+ POWER SUPPLY
IN STOCK NOW!
3 Months Warranty
Only £59.95
Acorn Electron
Power Supply £9.95
Scoop Purchase

PACK 1

PLUS 1	£49.95
VIEW	£14.95
VIEWSHEET	£14.95
OFFER	£79.85
PRICE	£69.95

PACK 2

ELECTRON COMPUTER	£59.95
PLUS 1	£49.95
VIEW	£14.95
OFFER	£124.85
PRICE	£99.95

VOLTMACE

Twin Joysticks for
use with Plus 1 or BBC
£19.95 £14.95

EDUCATION SPECIALS

Linkword German	£14.95	Maths 'O' Level	£12.65
Linkword Spanish	£14.95	Maths 'O' Level II	£12.65
Linkword Italian	£14.95	Biology	£12.65
IDO	£12.65	English	£12.65

ANY 2 FOR £3.95

ELECTRON ROM CARTRIDGES

3 GAMES WERE £19.95
NOW ONLY £14.95

ROM 1 Stock-Car,
Cybertron Mission, Bumblebee

ROM 2 Killer Gorilla,
The Mine, Positron

ROM 3 Felix In The Factory,
Electron Invaders, Chess

New - IMOGEN

BBC only cassette	£7.95
5.25" disc	£8.95
Compact 3.5"	£10.95

CUMA DISC DRIVE INTERFACE FOR ELECTRON £69.95

enables you to use most BBC
discs and cartridges up to 32K

CASTLE QUEST MODEL B

BBC B DISC	£14.95	£5.95
BBC B CASSETTE	£12.95	£5.95

ELECTRON ROM CARTRIDGES

Logo Cartridge	£59.95	£29.95
ISO Pascal Cartridge	£59.95	£29.95
LISP Cartridge	£29.95	£9.95
Starship Command	£14.95	£2.95
Hopper Cartridge	£14.95	£2.95
Elkman ROM	£19.95	£15.95

HOME INTEREST		PRIMARY EDUCATION		BUSINESS		MICROPOWER GAMES	
Sentence Sequence*	£6.95	Watch Your Weight*	£6.95	Go	£7.95	Electron Invaders	£7.95
Word Sequence*	£6.95	Theatre Quiz*	£6.95	Felix & Fruit Monsters	£7.95	Frenzy	£7.95
Snapper	£6.95	Desk Diary*	£6.95	Chess	£7.95	Danger UXB	£7.95
Boxer	£6.95	Business Games*	£6.95				
Talk Back*	£6.95	Graphs and Charts*	£6.95				
Workshop*	£6.95						

SELECT ANY FIVE FOR ONLY £7.95 • ELECTRON ONLY *BBC Compatible

Recent releases at Special Prices

Superior Collection 1, 2 & 3 BBC/Ele	£9.95	£7.95
Beau Jollys' Computer Hits BBC/Ele	£9.95	£7.75
Five Star II BBC/Ele	£9.95	£7.95
Repton III BBC/Ele	£9.95	£7.95
Grand Prix Cons BBC	£9.95	£7.95
Oxbridge BBC/Ele	£7.95	£6.35
Cholo BBC Disc	£17.95	£14.35
Firetrack BBC	£9.95	£7.95

ELECTRON LANGUAGES

Lisp Cassette	£9.95	£2.95
Turtle Graphics	£9.95	£2.95
Cassette	£9.95	£2.50
Forth Cassette	£7.95	£2.50

FIREBIRD (BBC ONLY)

Microcosm	£2.95	£1.25
Fatman Sam	£3.95	£1.25
Star Drifter	£3.95	£1.25

BBC & ELECTRON • ANY FIVE FOR ONLY £7.95 ELECTRON ONLY

MICROPOWER MAGIC COMPILATIONS I & II

IN THE CHARTS NOW 10 ORIGINAL HITS

FANTASTIC VALUE

BBC B+/MASTER CASSETTE	£7.95	£5.95
BBC B+/MASTER 80T DISC	£7.95	£5.95
BBC B+/MASTER 40T DISC	£7.95	£5.95
BBC COMPACT DISC	£9.95	£7.95
ELECTRON CASSETTE	£9.95	£5.95

SCOOP PURCHASE

POWER PACK	
7 great games by	
Audiogenic BBC Cassette	
was £9.95	
NOW ONLY £4.95	

Electron Joystick Interface & Software

£14.95

Quickshot II Joystick with microswitch

£12.95

Magic Mushroom (Ele) £12.95 £2.95

Me and My Micro (Book only) £2.95 £1.00

Electron Advanced User Guide £9.95 £2.95



Send SAE for
New BBC Compact
3.5" Software list

AS
Name _____
Address _____
PLEASE ADD 95p P&P
and make cheques
payable to Software Bargains
goods despatched
within 48 hours

SOFTWARE BARGAINS

(a division of the micropower group)

Dept AS, 8/8A Regent St., Chapel Allerton, Leeds LS7 4PE

Tel (0532) 687735

(Answerphone w/e & eves)

SORT IT OUT YOURSELF

With our help, of course. You can get all your files in good order with these different sorting routines

Joe Telford

Most computing books consider sorting from a mathematical viewpoint: 'How long does it take to sort a list of 2000 numbers into order?' We studiously work through the examples, but why? How often do we need to sort numbers into order? Even in real life the biggest list of numbers which we commonly need to sort is 13 playing cards! Most of the real sorting is actually done with lists of names, and with data associated with those lists.

Real lists are there for real reasons. Let's take a typical list, say members of a photographic society. What sort of information would we need about them? The first rule of database building is to write down what we want to do with the information. From this we can define the list of names and the other data associated with the list which we require.

For each person we might need:

1. Surname
2. Forename
3. Title (Mr, Ms)
4. Street address
5. Town
6. County
7. Postcode
8. Phone number
9. Subscription (Paid or Due)
10. Camera type
11. Interests

11. Interests
Anyone intending to use this for a real photo-society would probably need to alter some items or add a few more items. There are two mechanisms for holding such data; the first is to keep it on disc as a file of information. This is shown in figure 1. Figure 2 shows how that file would exist in the computer's memory.

Look at figure 1. If we have a list of 10

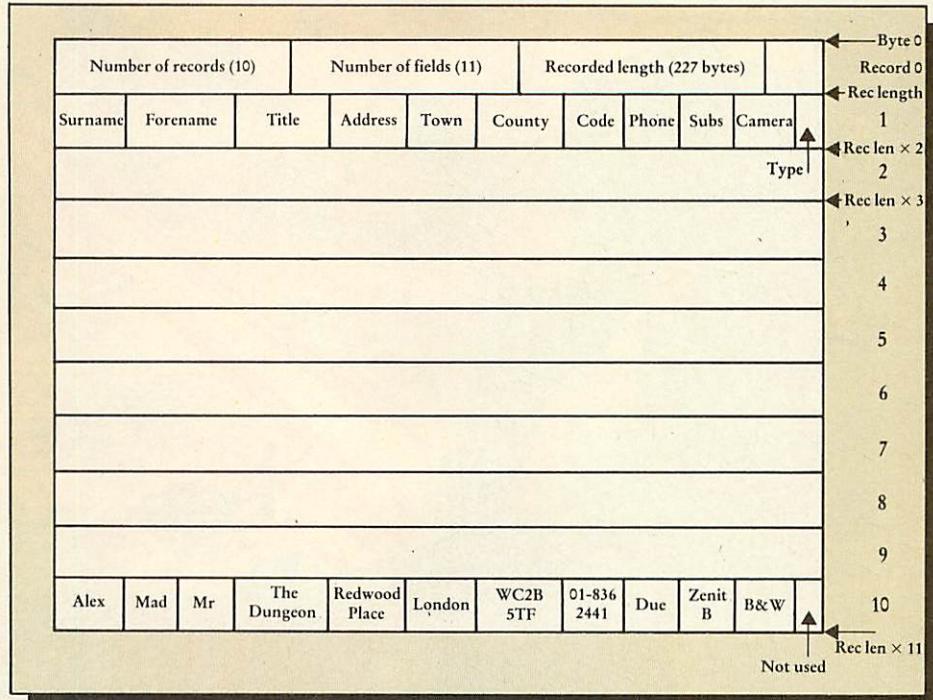


Figure 1. Organisation of disc file for data

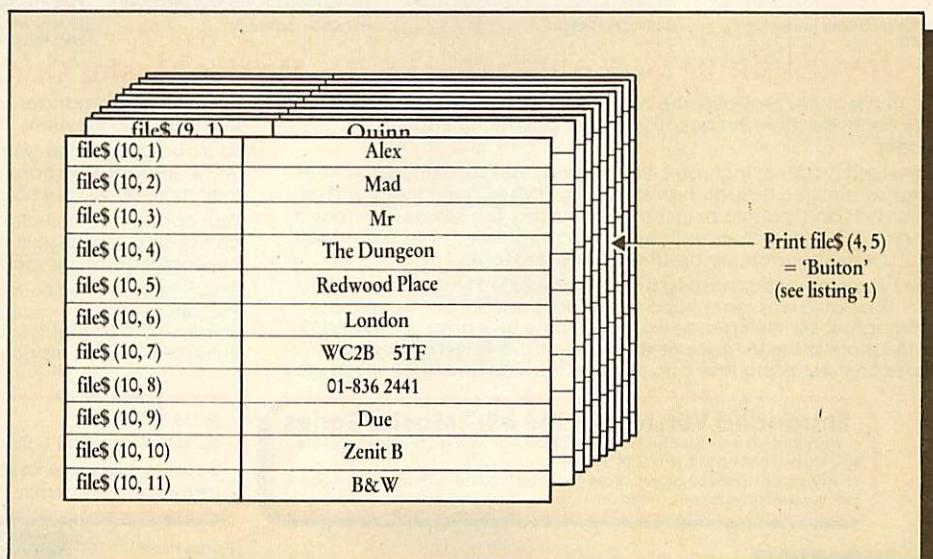


Figure 2. Same file in memory

NOW
AVAILABLE
FOR THE
ACORN ELECTRON

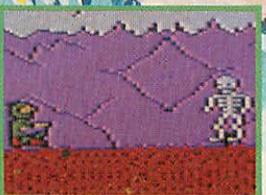
STRYKERS Run



Commander Stryker under fire
In the city



Battling in the air



An action close-up



Enemy equipment (Enhanced
BBC Master version)



A camouflaged Battle fortress
(Enhanced BBC Master version)

STRYKER'S RUN for the BBC Micro B, B+, Master, Master Compact, and Acorn Electron

Stryker's Run features probably the best graphics ever seen on the BBC Micro or Acorn Electron; the action is intense and the animation is superlative.

The battlefield graphics include cities, edifices, wrecked buildings, trees, gravestones, bridges, despatch-posts, military bases, helicopters and jet ships, with hills and mountains in the background. The Master-enhanced version also includes statues, watch-towers, a neglected cafe, a deserted cinema, aircraft hangars, aeroplanes, trucks and tanks.

For many years, a war has ensued between the Allied Nations and the Volgans. The battle was reaching a stalemate position, but recently the Allies through good intelligence work and some luck have managed to obtain the plans of the Volgan's next offensive. If the Allied Forces can capitalise on these plans they can end the impasse and the war. You play

the role of Commander John Stryker commissioned to take this top-secret information to the Allies' HQ.

Your character in the game can jump, run, duck, fire his laser pistol and throw grenades. He can also board aircraft and fly them, making use of their more powerful weaponry.

Your opponents, the Volgans, have a variety of weapons at their disposal comprising rifles, pistols, grenades, machine-guns, mortars, mines, helicopter gunships, rocket launchers and SAM missiles.

Stryker's Run is one of our most successful releases ever. It has topped the BBC Micro software charts for six weeks and received several glowing reviews: *"The graphics are stunning . . . This should be in every collection"* enthused A & B Computing.

Enhanced Version for the BBC Master Series

Stryker's Run is the first release to include a specially enhanced version for the BBC Master making use of its 128K of RAM. An extra 40K of detailed graphics are provided together with additional game features and atmospheric music.

BBC Micro Cassette £9.95 BBC Micro 5 1/4" Disc £11.95
BBC Master Compact 3 1/2" Disc £14.95 Acorn Electron Cassette £9.95

The screen pictures show the BBC Micro version of the game.
The graphics of other versions may vary.

**SUPERIOR
SOFTWARE
Limited**

ACORN SOFTWARE

Dept. STR2, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453.

Please make
all cheques
payable to
"Superior
Software Ltd".



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately.

members, then the simplest way to keep that on disc is to arrange an amount of storage for each person's information. The information on each person is called a record, and each record in this file takes up 277 bytes. In fact if you were to write down all the details for yourself, you would find that you were using only about 120 bytes of information (one letter or space takes up one byte) so a good deal of the file is redundant.

When writing filing programs, I generally do a byte count of the longest record (say 140 characters) then add on 20 per cent just in case, then two bytes extra per individual item of data (11 items per person therefore 22 extra bytes). In the current example we could get away with $140 + 28 + 22 = 190$ bytes per record. But because we will create each record from a DATA statement, which could hold 255 characters, we'll play safe and go for $255 + (11 \times 2) = 277$ bytes.

The different types of information for each person are in separate 'boxes' along each record. These are called fields, so this file has 10 records, each of 11 fields. Record zero is different to the others, because the information which it contains is different. It contains:

- The number of records in the file
- The number of fields in each record
- The number of bytes between records

The file is set up for random access; we can find any record simply by knowing its record number. For example, to read record number six:

- Open the file
- Read the file details
- Point to record six
- Read the record
- Close the file

To add a new record seven we follow similar steps:

- Open the file
- Read the file details
- Point to record seven
- Write the record
- Close the file

By reading and writing records like this, we can use the disc memory, although it's very much slower. We can load the database into memory if it is less than 200 records in length.

Once the file is read into memory, its format is different. It consists of a structure called an array, which has a name and two subscripts. The name which we chose was file\$(record,field), the '\$' indicating a string or text array. The two subscripts or indices, 'record' and 'field', help us to relate

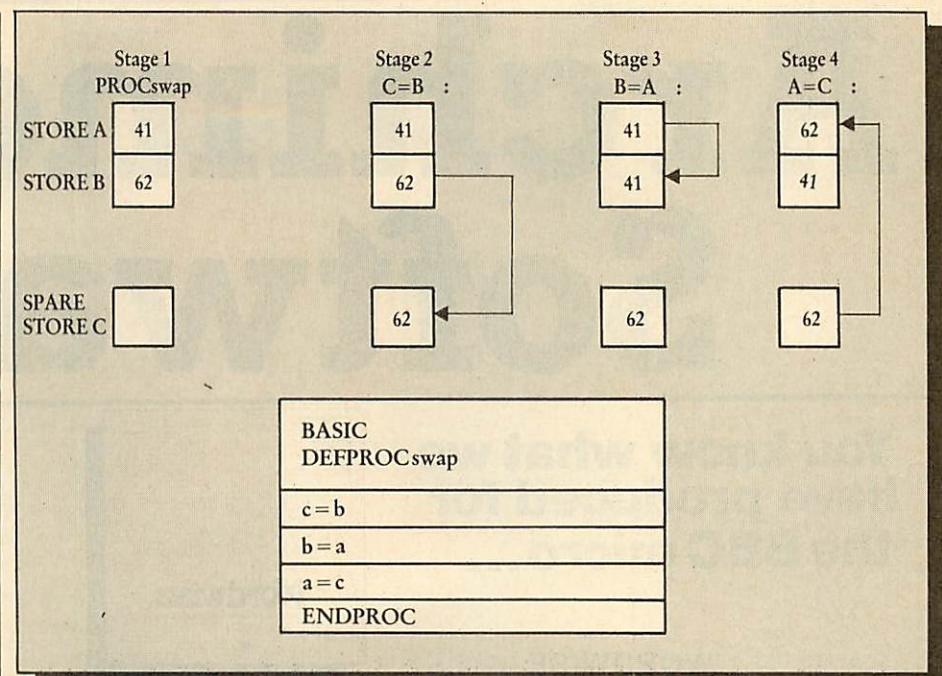


Figure 3. Swapping simple variables

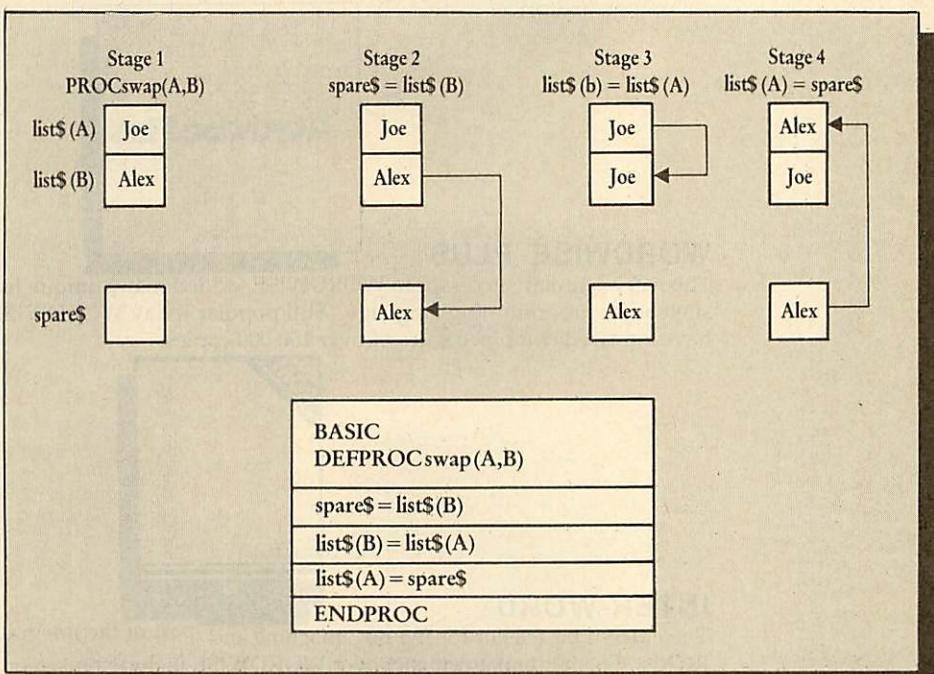


Figure 4. Swapping elements of an array (called list\$)

the item in memory to its original place on the disc file. Look at figure 2. The item called file\$(10,4) - 'The Dungeon' - is actually the same item as the fourth field in record 10 of figure 1.

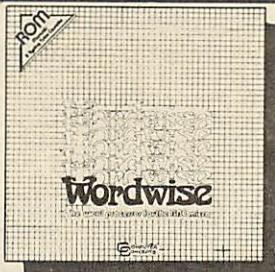
Listing 1 in the yellow pages is the file creation program for the database. The first item of data is the number of fields in each record: change this if you want to use more than or less than 11 fields. Whatever this number ends up as, make sure that each of your records has exactly that number of fields. Also ensure that the last line of data simply contains the word **“**END**”**. This tells the computer that

the last record has been encountered, so we don't need to count the number of records!

The first few lines of the program open the database file, which we call 'Clubdat' – ADFS users can give it a longer name like 'Club-data'. Then the key variables like record length in bytes, the initial record number and the number of fields are set up. The program then into a REPEAT ... UNTIL loop which moves the file pointer to the start of each record in turn, then reads an item. If the item isn't '**END**', then the procedure PROCtxtfields is called and the next 11 data items are read and transferred to file. When '**END**' is

Archimedes Software

You know what we have produced for the BBC micro ...



WORDWISE

One of the first ROMs for the BBC Micro and for many users their first introduction to word processing. Fast, and very simple to use, this offers all the basic word processing facilities at an unmatched price.



WORDWISE PLUS

This very popular successor to WORDWISE added many unique features to the original such as its programming language. Still popular today WORDWISE and WORDWISE PLUS have amassed combined sales of over 150,000 copies.



INTER-WORD

The current best seller for the BBC machine and part of the integrated suite of application ROMs. Further enhancements over WORDWISE include on screen styles, page layout, menus and multi-columns but it is still as easy, if not easier, to use than WORDWISE.

...and now for the Archimedes...

COMING NEXT

The new word processor for the Archimedes will be a considerable advance over any currently available word processor. More powerful than anything that has gone before, but still as easy to use as ever. See it for the first time at the PCW show at the end of September. Contact us for details of this and other Archimedes software.



Computer Concepts

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone: (0442) 63933

encountered, the pointer is reset to 0 and the file details are transferred. The program ends by closing the file.

The program prints out the file as it transfers it – useful in the debugging stages, but tedious. If you like, remove any occurrences of PRINTItem\$;"/";

Once the database file is on disc, the problem remains of accessing it, sorting it and printing it. This is performed by listing 2 on the yellow pages, which is the basis of the remaining programs in this article. This program is essentially in two parts, PROCreadfile and PROCaddressdata. PROCreadfile opens the disc file and reads its details. It then creates an array in memory called file\$() and reads each item from the file into the array. It uses a little backward counting routine to indicate its progress in loading the file, and it concludes with an 'All read' message.

PROCaddressdata goes through the file\$() array and prints out an address, followed by the other information on that person. Readers working towards their own databases should change this procedure depending on the number of fields, the content of each field and the actual print-out required.

There are two other procedures, PROCswap and PROCTime, and these will be used later on.

Starting to sort

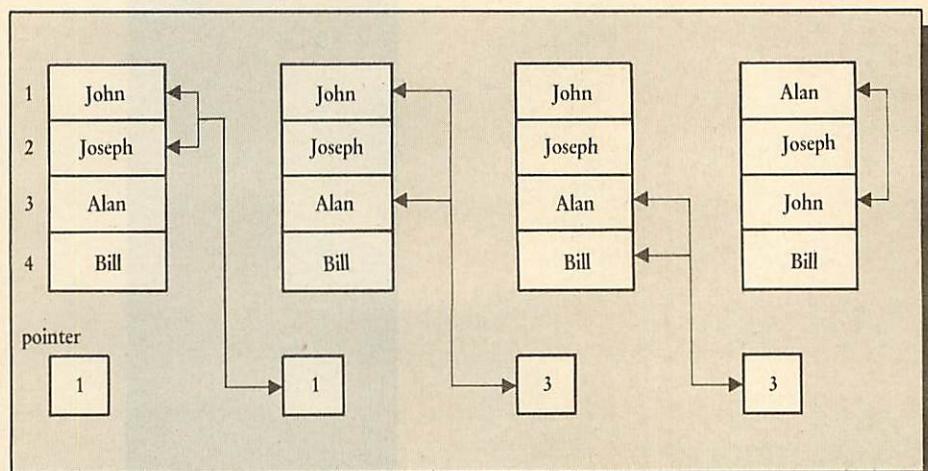
Try this. Get a pack of cards, separate all the diamonds and shuffle the 13 cards, then lay them out in front of you from left to right, face up. Now put them into order. OK? Well, now you know everything about sorting. No? Let's have a closer look.

There are two ways in which we could have sorted the cards. The first approach is to look at every pair of consecutive cards and, if they are out of order, swap them.

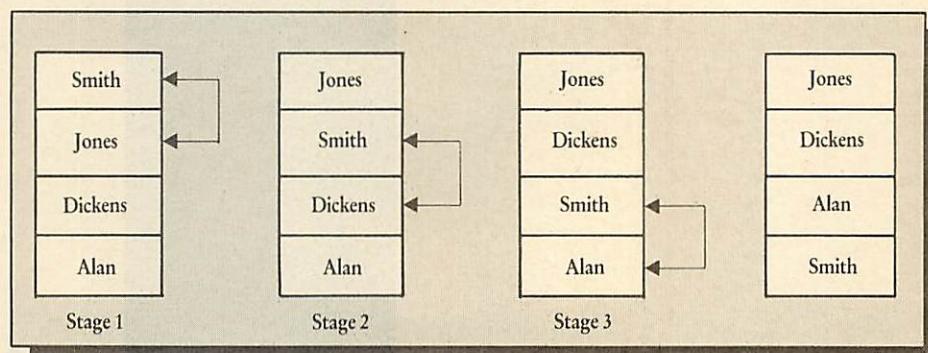
The other way is to make a second pile, by scanning the cards for the ace, moving that across, then scanning for the two. This speeds up as you go, as there are fewer cards left to scan.

Well, now that we've sorted the cards and seen how it's done, we can consider the two main elements of any sort. These are the comparison and the swap. The swap is a physical activity which takes a measurable time. For humans the comparison usually takes almost no time. Generally speaking, the mechanical task of re-ordering the list, along with the small chance of an error, means that a computer is better fitted for the task than a human being.

The swap is a fundamental element of



5 Exchange sort: single run through the list



6 Bubble sort: single run through the list

any computer sorting. Figure 3 shows the stages for a simple swap of two numbers. Notice that three stores are used, one of which is a spare, used only for temporary storage. A more realistic task would be to swap two names, before sorting a list alphabetically. Look at figure 4. This shows how two elements in a string list can be swapped: notice that the list is called 'list\$()' and the elements to be swapped are sent to the procedure as 'A' and 'B'. This is useful because the procedure can be used over and over, to swap any number of elements in the list. Notice too that the spare store must be a string, but while we are working within a list it needs only to be a single variable.

The database file is a two-dimensional array, made up of records and fields. If we are sorting the file, then whenever we swap an element, say a surname, the rest of the information for that record should also be swapped. Otherwise the information would get mixed up. To do this swap of all the information in a record, we use an array, 'spare\$()', which can take every field of a record at one go.

Look at listing 2 again. The particular procedure of interest now is PROCswap. This transfers record 1 into the spare\$() list, then record 2 into record 1, followed

by the spare\$() list into record 2. The time taken to swap 11 items, with 33 assignments per swap, is quite high in computing terms. Whichever sorting method we decide to use, we should bear this swapping time overhead in mind, because speed is often very important.

Listing 2 also contains PROCTime. This procedure simply prints out the time taken to sort the records into order.

Type in listings 3, 4 and 5 from the yellow pages. These each use a different method of sorting the array into order. Once all the programs are entered and saved on disc, load listing 2 and *SPOOL it into a file called 'BASE'. Type:

```
LOAD "PROG2"
RENUMBER 1000
*SPOOL BASE
LIST
*SPOOL
```

Now choose the kind of sort you want and load it, then add the base program:

```
LOAD "PROG3"
*EXEC BASE
RUN
```

When running the program remember that you may need to change the calling lines so that the sort occurs on the field you want. They are all set at the moment to sort on field 1, the surname, but if you wanted to



Calligrapher.

**The most
comprehensive
Document Processor
for the
Atari ST**



Computer Concepts

Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX, England.

Telephone (0442) 63937

TO BE RELEASED AT
THE PCW SHOW
END OF SEPTEMBER

split the club into 'paid' and 'due' members, then simply sort on field 11.

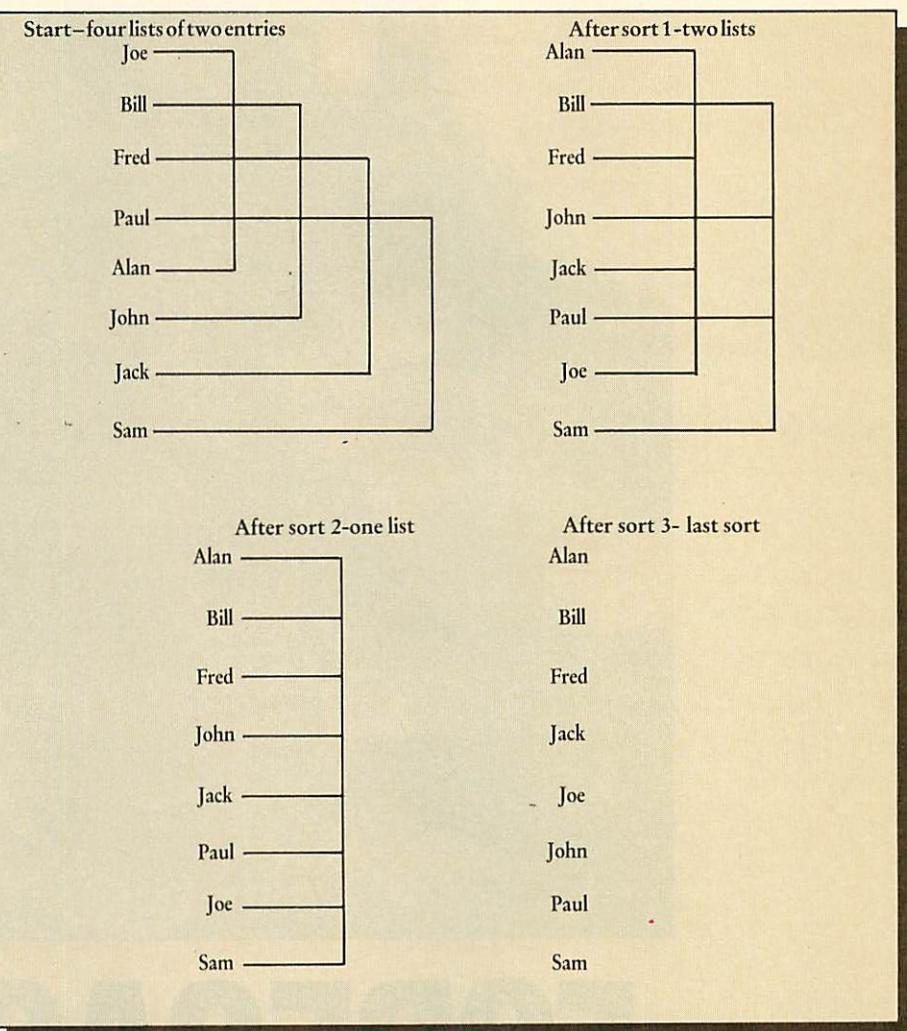
Figure 5 and PROCexchange of listing 3 explain the way that the exchange sort works. Every time the program passes through the list it compares each item with the highest item found so far. If the current item is higher in order than highest so far, then the new item becomes the highest, and the pass continues. At the end of the pass (called NEXT loop2% in the program) the highest item is exchanged with the item at the top of the list. So we know the highest item is at the top of the list. Now all we need do is sort the rest of the list. Another pass begins, but starting one below the new top of the list, so that the next swap will be to the second position. This continues until the entire list is sorted. The table shows that even with a large number of items, the number of potential swaps is still quite small. The number of comparisons is much higher, but comparisons can be accomplished much more quickly than swaps.

We met the bubble sort when we looked at the card sorts. Figure 6 and listing 4 explain how this works. This sort is the easiest of all to write, and for a file of 10 records just consists of 10 passes through the 10 records, comparing and swapping consecutive records which are out of order. It is like the exchange sort – except that instead of comparing items to find the largest, then swapping the largest to the top, the bubble sort keeps swapping items, and the largest goes to the top automatically. This means that while the number of comparisons matches those of the exchange sort, the number of potential swaps is much higher, making the sort slower.

A third sort is the Shell-Metzner sort. This is one of my favourite sorts, because it reduces the number of comparisons and swaps to manageable levels with very large files. Unfortunately it is quite complex.

Let's play a game where we think of a number between one and eight. Providing you tell me whether I'm higher or lower with each guess, I can always find the number in three or fewer goes, because I become twice as precise at each turn. This is a good analogy of how the Shell-Metzner sort comes to terms with long lists of items to be sorted; by splitting them into shorter lists, each of which can be speedily sorted.

Look at figure 7. Imagine a list of eight elements out of order. The Shell-Metzner sort subdivides this list into four lists of two. These four lists can be easily sorted



7 Shell-Metzner sorting of an eight element list

HOW THE SORTS COMPARE

Items	Exchange sort			Bubble sort			Shell-Metzner sort		
	Comparison	Max swaps		Comparison	Max swaps		Comparison	Max swaps	
2	1	1		1	1		1	1	
4	6	3		6	6		5	5	
8	28	7		28	28		17	17	
128	8128	127		8128	8128		769	769	

with a single swap. Next the part-sorted lists are made into two lists of four elements each, and because they are already part sorted, each list is placed in order quickly. The last stage is to combine the four-element lists into one eight-element list. Again sorting is performed quickly, because the list is already partly sorted. The impressive thing about the Shell-Metzner sort is the low number of comparisons which have to be made. While in short lists the number is little different from the bubble or exchange sorts, as the list size increases, so the number of comparisons reduces when compared with the other sorts. The maximum number of potential swaps is the same as the number of comparisons and in many cases the

Shell-Metzner sort may be the fastest one.

The timing procedures in the sort programs are intended to enable readers to test the sorts and find which is fastest. Of course, using a file of 10 items is kids' stuff for all these sorts, so listing 6 is included to create a file of 100 random records (numbers in string format) of 11 fields. Try the sorts on these numbers and make a list of which perform best at small and large file size. Be prepared for some surprises; I was perplexed until I realised just how long it took to swap 11 fields. Compared to that, comparison time is almost negligible.

Remember though, these tests are for files in memory. Once we get to very large disc files, another picture appears – but that is another Jotting!



FORECASTS BY FAX

Weather forecasts are broadcasts on short-wave radio, and only simple equipment is needed to receive the fax signals

Terry Morris

Short-wave radio abounds with an enormous variety of signals, and among the expected clutter of political broadcasts, embassy teletypes, amateur transmissions and static there are a few surprises. Weather Fax is one – pictures on the radio.

Weather Fax is widespread, has a common protocol and is the closest competition which radio can offer television. Transmissions contain picture data, mostly maps, interspersed with the occasional satellite photograph. These Fax broadcasts

are provided on a 24-hour basis by both military and national meteorological services for the benefit of the airborne and maritime transport industries. In the United Kingdom, this service is provided by the Meteorological Office.

Weather Fax pictures give a wide variety of weather data and are particularly useful within the school or college curriculum, lending a welcome dynamic aspect to the study of meteorology, climatology and related subjects. As little as four hours can lapse between successive picture updates,

and the maps can provide a detailed synoptic view of shifting weather patterns. What is more, the data is free!

Fax signals are easy to receive and decode. You don't need a complicated aerial system, only a short-wave broadcast receiver and some simple additional electronics. Picture data can be easily downloaded using a BBC Master 128 or BBC model B fitted with shadow RAM.

There is often a considerable similarity in the output of various Weather Fax stations, although they can and do offer

various maps for specialised purposes.

A Significant Weather Prognosis is a product common to most stations – it provides data relating to wind velocity, cloud top and base heights, cloud types, thunderstorms, clear air turbulence, fronts and so on. Both air and maritime traffic would be able to make good use of this type of data. Aircraft, for example, would do well to avoid turbulent areas, where buffetting can make life very unpleasant. Figure 1 shows Australia in for some quite spectacular weather on January 28 this year – Darwin, for example, having its own private thunderstorm.

A Mean Sea-Level Analysis (figure 2) is an old favourite, quite familiar from the television weather report. Typically it shows isobars and the broad movement of weather fronts.

Other products typically include neph-analysis (cloud cover), swell-wave analysis and upper air analysis and forecast, the latter being of special interest to pilots. To complete the service, many stations also broadcast a timetable of map transmissions, with times usually given as GMT.

Black and white

Most Weather Fax transmissions are to be found scattered through the short-wave radio spectrum (2000kHz to 30MHz). Only black and white pictures are involved and therefore only black and white data need be included in the transmission.

The most common broadcast technique appears to use the upper sideband (USB) of the carrier which is frequency modulated with a typical total shift of 800Hz, the higher frequency representing white in the picture. With a radio switched to USB operation, the two frequencies appear as distinctly separate audible tones.

The general technique for Fax transmission is shown in figure 3. The original picture is wrapped around a drum which is rotated once every half-second. Picture transmission is preceded by a continuous low tone, followed by a loud 'blurt' and then about 30 seconds of synchronisation pulses in which a continuous lower tone (represented by black) is broken by pulses of higher pitched tone (white) – the ratio of black to white is about nine to one. The white to black transition represents the synchronisation pulse.

A photocell is aimed at the rotating drum, and it detects the difference between the black lines and the white background as the drum spins. As the drum rotates, the photocell gradually scans lengthways along

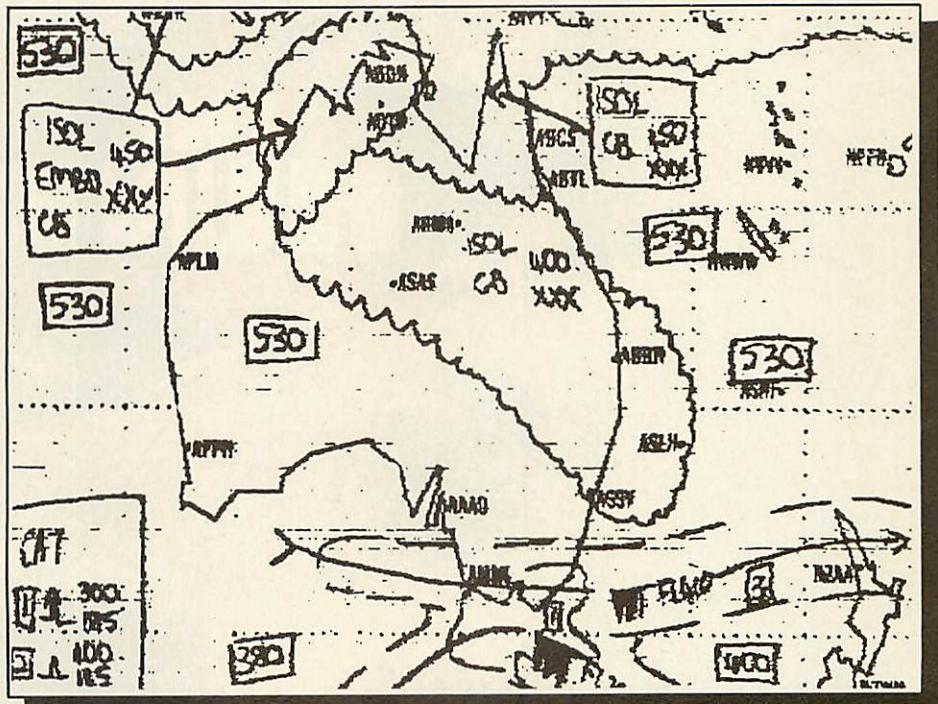


Figure 1. Significant Weather Prognosis

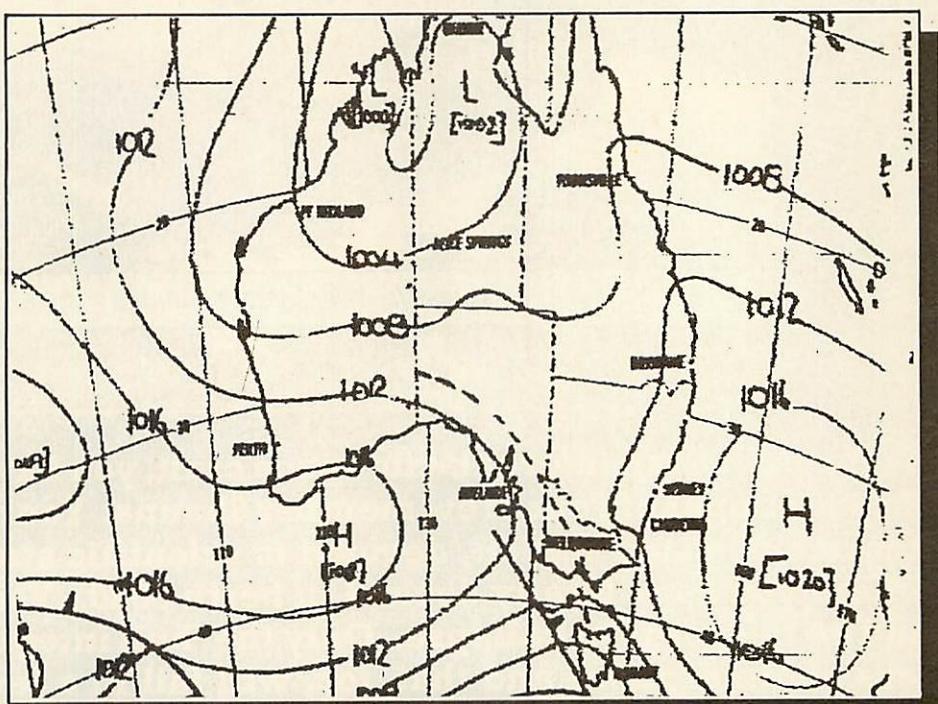


Figure 2. Mean Sea-Level Analysis

the drum. The photocell signal is used to frequency modulate the carrier wave.

Digital data transferred by frequency modulation of a carrier is a common technique known as frequency shift keying (FSK) – a version of the idea is used by all BBC micros to store data and program on cassette. Weather Fax pictures are made up of 1080 lines and a total of nine minutes are required for the complete transmission of a map. Completion of the picture is signalled by a further loud 'blurt'.

No information concerning the propor-

tions of the picture is transmitted with Weather Fax. The Index of Co-operation (IOC), defines how the picture is proportioned. The IOC divided by the width in inches gives the number of scan-lines per inch – conventionally it is equal to about 576. So if a picture is 12 inches wide, there are 576/12 or 48 scan-lines per vertical inch. A glance at the sample pictures will, however, reveal that they are slightly ‘tall’ and it illustrates the practical difficulties in exactly matching the IOC of the computer system with that of the transmitter.



WE ENTHRALLED YOU WITH ENTHAR SEVEN.
WE THRILLED YOU WITH THE RICK HANSON TRILOGY.
NOW GET READY TO BE DAZZLED BY

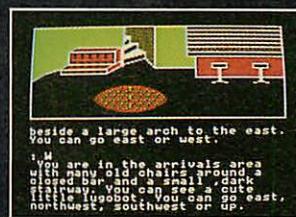
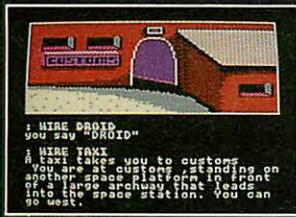
RING
FOR MASTERS
& ELECTRON
AVAILABILITY

THE HUNT
Search for Shauna

AN ADVENTURE WITH GRAPHICS

As the pilot of an intergalactic space craft, you have searched the galaxy for the kidnapper of your crew member Shauna. Your mission has led you to an enormous space station, devoted to scientific study and experimentation, where you have finally docked in berth 5820. Your space craft is battered and on the verge of collapse. Only the 'hull integrity system' is preventing loss of atmosphere and that, too, will fail in a few seconds time!

Enter the exciting world of the Robico adventure of the year!
THE HUNT Search for Shauna - It won't disappoint you.



BBC B, B + CASSETTE VERSION: £9.95

5 1/4" DISK VERSION WITH SPECIAL DISK GRAPHICS: £12.95

ADVENTUROUS PEOPLE LOVE ROBICO

ROBICO, 3 Fairland Close, Llantrisant, Mid Glamorgan. CF7 8QH Tel (0443) 227354

Writing the program

On the programming side, the first job of any receiver program is to recognise the regular 0.5 second synchronisation pulse. Once a valid sync pulse is found then the program must immediately proceed to line scanning so that synchronisation is not lost.

Each line of picture takes 0.5 seconds to broadcast. On a mode 0 screen, each line can be sampled 640 times within this time. That means one sample every 780 microseconds or so.

Rapid sampling requires the use of machine code and the program is most efficiently written if it is interrupt driven. The T1 timer of the user 6552 VIA can be used to generate interrupts after an interval which corresponds to the sample interval. The service routine, which should be placed in the main interrupt vector IRQV1, can then check the user port data and write the point to the screen.

Because the BBC Master is not a dedicated Fax receiver there are a number of pitfalls to watch out for.

- Other interrupts may delay the sampling, so disable all unwanted interrupts by writing to the system interrupt enable register at &FE4E. Be sure not to forget to re-enable it at the end of the program!
- ROMs get a service call during execution of an interrupt service routine. To avoid this disable all unwanted ROMs for the duration of reception; this is important as some of them can keep the machine occupied for a considerable time.
- The absolute value of the interrupt timing and signal synchronisation depend upon the computer's crystal oscillator. Unless you are very lucky, you will find that your Fax picture will tend to drift to one side because the Fax transmitter doesn't quite agree with the micro about absolute time. You can adjust the interval between sampling interrupts by an infallible method known as trial and error.

The following steps represent the backbone of the author's Fax decoder program:

- Allocate sideways RAM areas 4, 5 and 6 for data with *SRDATA
- Select mode 0
- Reset vectors
- Wait until a valid synchronisation pulse has been found
- ignore the next 60 lines which contain the remaining sync pulses and some useless picture information
- Record 256 lines of picture at 840 dots per line
- Switch to shadow screen and record another 256 lines

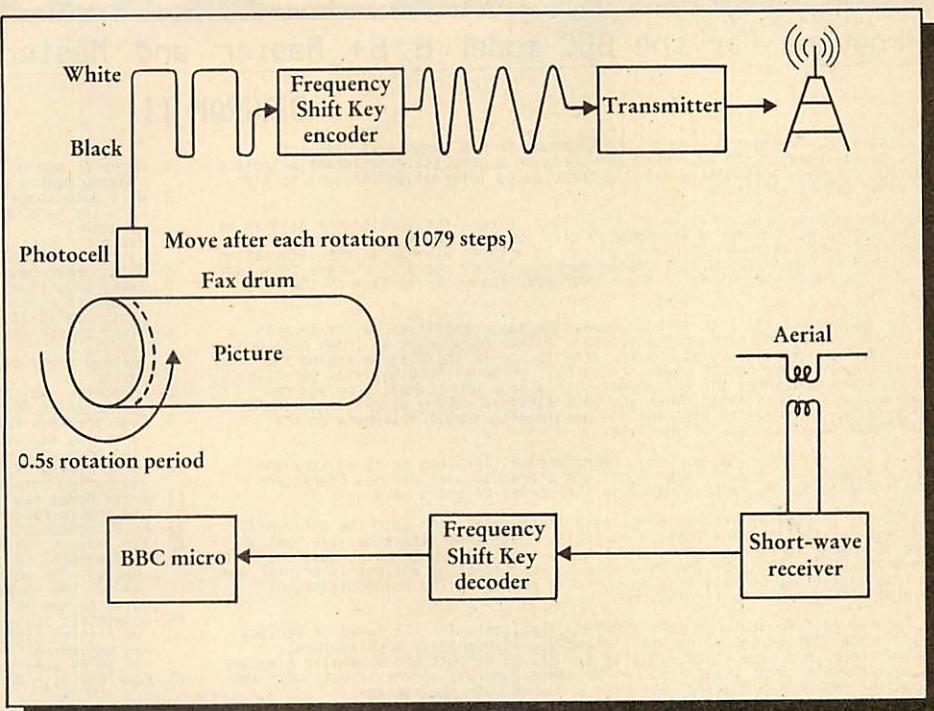


Figure 3. Principles of Weather Fax transmission/reception

- Transfer both screens to sideways RAM
- Clear both screen and shadow screen data areas of all data
- Record another two screens into the normal and shadow memory as above
- Write the picture to disc. Save the sideways RAM first, then the normal and shadow screens.

This program will record 1024 of the 1080 lines of Fax picture data. Losing the extra will not normally be important.

WEATHER FAX FREQUENCIES		
GFA service		
3289.5 kHz	24-hours	
8040.0 kHz	24-hours	
11086.5 kHz	24-hours	
4610.0 kHz	18:00 to 06:00	
14582.5 kHz	06:00 to 18:00	
GFE service		
4782.0 kHz	24-hours	
9203.0 kHz	24-hours	
14.436 MHz	24-hours	
2618.5 kHz	18:00 to 06:00 winter 19:00 to 05:00 summer	
18.261 MHz	06:00 to 18:00 winter 05:00 to 19:00 summer	

The Weather Fax service is provided by the Meteorological Office, and is broadcast from Bracknell. The GFA provides general weather information; GFE is more concerned with the upper air and is particularly applicable to aviation. All times are GMT.

What's required to receive Fax?

You will need the following equipment:

Aerial: a half-wave dipole, preferably fitted with a matching transformer or balun, and 50-ohm feeder cable.

Receiver: if you have limited funds, then go for a sensitive short-wave receiver capable of upper sideband reception. A digital frequency display is useful. All of the pictures accompanying this article were received on a Grundig Satellit 3400. This model is not available in the United Kingdom; its nearest equivalent is the Satellit 650, and there are other similar models.

Fax transmissions are scattered across the short-wave spectrum and are thus not confined to the amateur bands. Many good quality receivers are built to sweep only the amateur bands, but most Fax transmissions lie outside them.

For those to whom money is no object, then one of the latest microprocessor controlled receivers, such as the Yaesu FRG-8800, would be ideal because they provide fine-tuning control coupled with broadcast capability. They also possess low drift which is ideal for pre-programmed recording of weather data as they can be tuned beforehand and won't drift off stations. Also they can be fitted with an RS232C serial interface, thus permitting computer control. Many Fax stations transmit simultaneously on several different frequencies; a computer can be programmed, for example, to select and read the signal strength of each of those frequencies and therefore make a decision to record from the strongest.

PINEAPPLE SOFTWARE

Programs for the BBC model B, B+, Master and Master Compact with disc drive

DIAGRAM II

Diagram II represents a major breakthrough in the techniques used for drawing software on the BBC micro. It works on a completely different principle to other drawing software by storing the drawing information straight to disc as coded 8x8 pixel blocks.

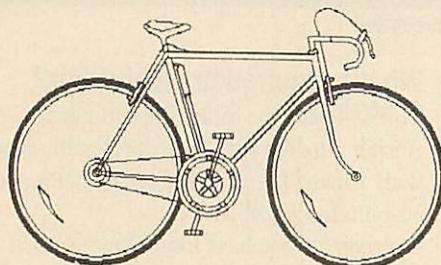
This technique has three major advantages. First, the size of the diagram is only limited by the amount of space on disc. Second, there is no limit to the amount of information which can be stored on a given diagram as the information is stored on disc and not in computer memory. Third, the disc storage technique allows the smooth scrolling of the screen over the whole surface of the diagram.

For people not familiar with Diagram, the basic operation of the program is to first display any part of the diagram, either by quoting an index name or screen number. At this point you are free to scroll the diagram around the screen using either cursor keys, trackball or mouse. You may stop scrolling at any point and enter the edit mode which allows you to modify or add new information to the diagram. When you have finished making alterations, the new information is stored to disc and you are free to scroll elsewhere on the diagram stopping to edit at any time.

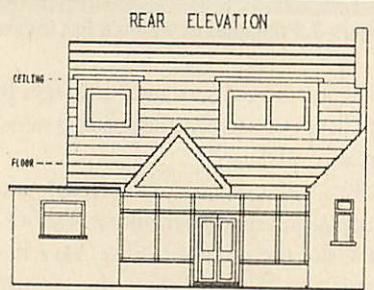
The edit features are now very comprehensive. Text may be typed straight from the keyboard, and if other fonts are stored as user defined characters then these fonts may be printed using the normal keyboard keys.

The print routines are now completely 'scalable' with both the horizontal and vertical scales being totally variable in 1% steps between a size that will give 18 mode 0 screens on an A4 sheet and a size that would print just one pixel on a sheet! The routines are adaptable to most types of dot matrix printer and full advantage may be made of wide carriage printers. The printouts may be rotated through 90 deg. if required.

The new editing features make DIAGRAM II suitable for all types of serious drawing application including scale drawings, flow charts, architectural, family trees, and many other subjects as well as circuit and schematic diagrams. An example of what Diagram II can do, this complete advertisement (with the exception of the PCB drawing) has been produced with the package.



PCB



Pineapple's now famous printed circuit board draughting aid produces complex double sided PCB's very rapidly using any model BBC micro and any FX compatible dot-matrix printer.

The program is supplied on Eprom and up to 500 component and 500 ASCII component descriptions may be stored for each PCB. There is no limit to the number of tracks that may be stored for a given PCB although the maximum board size is restricted to 8" x 5.6".

Using a mode 1 screen, tracks on the top side of the board are shown in red, while those on the underside are blue. Each side of the board may be shown individually or superimposed. A component placement screen allows component outlines to be drawn for silk screen purposes and component numbers and outlines entered on this screen may be displayed during track routing to aid identification of roundels.

The print routines allow separate printouts of each side of the PCB in a very accurate expanded definition 1:1 or 2:1 scale enabling direct contact printing to be used on resist covered copper clad board. The print routines are very fast taking typically 5 minutes for a 1:1 print of a 7" x 5" board. This program has too many superb features to describe adequately here, so please write or phone for more information and sample printouts.

PRICE £85.00 + vat

MARCONI TRACKERBALL

This high quality device comes in three versions. Version one is for the standard BBC micro and comes with the Icon Artmaster drawing package from Micro-Draw, and Trackerball Utilities which allow the trackerball to be used with other software.

Version two is for the Master 128 computer and this comes with the Pointer Rom. This is a Rom which allows the Master to be configured for use with the Trackerball and has commands to enable the Trackerball to intercept the cursor key or joystick routines of other software. Commands are also available to reverse the axes of the trackerball and set the sensitivity. The three buttons may also be set up to produce any ASCII code.

Version three is simply the bare Trackerball which comes without software but is suitable for use with specially written software such as Diagram or Diagram II.

Trackerball adapters are also available which plug onto the end of the cable and convert the connections of the trackerball to be the same as a mouse. This enables the trackerball to drive all types of 'mouse' software.

For Model 'B' and B+ (with Icon Artmaster)	£ 60.00 + vat
For Master 128 (with Pointer Rom)	£ 60.00 + vat
Bare Trackerball (no software)	£ 49.00 + vat
Pointer Rom - available separately	£ 12.50 + vat
Trackerball to mouse adapters	£ 8.00 + vat
Postage & packing on Trackerballs	£ 1.75

All orders sent by return

VISA

39 Brownlea Gardens, Seven Kings, Ilford, Essex IG3 9NL Tel 01-599 1476



SUMMARY OF DIAGRAM II FEATURES

1. Works on any model BBC computer with either DFS or ADFS. (ADFS only if Shadow memory available).
2. Will automatically take advantage of shadow memory (any make) to provide more User Definable Characters, 880 with Shadow, 381 without Shadow.
3. Rapid horizontal and vertical line drawing routine with automatic joins for circuit diagrams.
4. Full rubber band line drawing and circle drawing modes.
5. Takes advantage of the Acorn GXR rom to provide drawing of arcs, sectors, chords, parallelograms, ellipses, and flood filling. Note this rom is already fitted to Master and Compact machines.
6. Pixel cursor drawing and deleting mode allows very fine detail to be added.
7. Defined areas of screen may be moved, copied, deleted or saved to disc.
8. On-screen indication of cursor position shows either the cursor position on the overall diagram or the distance from a preset point.
9. Keyboard keys may be predefined to print User Defined Characters, enabling new character sets to be stored as user defined characters and then printed straight to the screen using the keyboard keys.
10. Wordprocessor files may be loaded to the screen and automatically reformatted into any shape screen area.
11. Index names may be set up to point to given areas of a large diagram, to enable rapid access to a given point on a diagram.
12. Fully compatible with Marconi trackerball and most makes of mouse.
13. All Diagram 'Utilities' are included, enabling screen ident numbers and borders to be added, and any area of diagram to be moved or copied. The whole diagram may be displayed in reduced scale (either 4x4 or 8x8 format) on a single screen, and the size of the overall diagram may be increased or decreased.
14. Completely scalable print routines allow any area of the diagram to be printed either horizontally or through 90 deg. in scales that may be varied in 1% steps allowing up to 18 mode 0 screens to be printed on an A4 sheet (still with readable text).
15. Complete with 40 page easy to understand handbook.

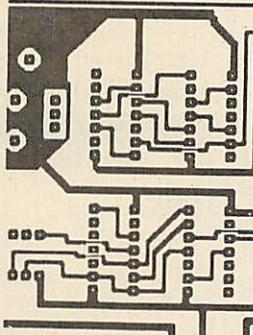
Diagram II consists of a set of disc files and a 16k Eeprom. The disc supplied is formatted in 40T on side 0 and 80T on side 2. Please state if this is unsuitable for your system, or if you require a 3.5" Master Compact disc.

DIAGRAM II - £ 55.00 + vat

P & P free (except overseas)

H.B. Upgrades are available to existing Diagram owners. Please contact Pineapple if you have not received an upgrade letter.

PCB PLOTTER DRIVER



A new addition to the PCB software is the PCB plotter driver program. This enables files produced by PCB to be used in conjunction with most types of plotter to produce plotted output rather than the normal dot-matrix printer output.

In this way plots may be produced directly onto film or even directly onto copper board with an etch resistant pen if a suitable plotter is available. The program is suitable for use with most makes of plotter including Hewlett Packard, Hitachi and Plotmate M. The program can also be configured to work with other plotters by entering suitable plotter instructions.

All the features of the printer driver are included, such as the automatic thinning down of tracks between roundels. Mirror image plots are also available.

PRICE £ 35.00 + vat

MITEYSPICE

MiteySpice is a very powerful AC & DC circuit analysis package with graphics

suitable for use with any model BBC micro including those with 2nd processors. As well as all the usual facilities available with this type of program, non-linear effects, small signal, noise measurements and sweeps may be performed. Component values may be swept, allowing component tolerances to be investigated as well as thermal performance etc. Comprehensive transistor modelling is incorporated using a 20 parameter Ebers Moll description. The program is supplied on disc with a very comprehensive 49 page manual.

PRICE £ 119.00 + vat

ADFS UTILITIES ROM - ADU

ADU is an invaluable utility for all ADFS users. It adds over 20 new commands to the ADFS filing system as well as providing an extensive menu facility with over 35 sub commands covering areas such as repeated disc

compaction, saving and loading Rom images, auto booting of files and many more. Copying of DFS discs onto ADFS discs can be made in one pass with automatic creation of the required directories on the ADFS disc. All functions are fully compatible with Winchester drives including *BACKUP which allows backing up of Winchesters onto multiple floppies.

Additional *commands include:- *ADU, *BACKUP, *CATALL, *CHANGE, *DFSDFS, *DIRALL, *DIRCOPY, *DIRDESTROY, *DIRRENAME, *DISCEDIT, *DRIVE, *FILEFIND, *FORMAT, *FILELADU, *LOCK, *MENU, *PURGE, *PRWERK, *UNLOCK, *VERIFY, *UNFORMAT.

PRICE £ 29.00 + vat

Frequency Shift Key Decoder: This is a simple circuit, often available in kit form (and even on a single chip) from electronic hobbyist suppliers. It converts the audible Fax tones to the TTL logic levels understood by the computer. Generally, the radio must be tuned so that the higher of the two tones registers at about 2300Hz. Hence a pitch-pipe tuning aid can be useful at this stage before a 'feel' is developed for the transmissions.

The decoder is typically powered from the computer (+5V and ground) and provides a TTL data output. The decoder gets its audio data from the receiver's speaker output while the data connections can be made to the micro's user port.

A BBC Master 128k or model B fitted with shadow RAM: The Master is a most useful machine for Fax reception. The incoming picture can be brought in as a real-time display, and broken into four mode 0 screens of data (80k of data in total). The presence of the real-time clock is an added bonus because it can be used to create a pre-set recording facility. Furthermore, the presence of the ADFS means that as many as seven pictures can be saved onto one disc

without recourse to any screen compression techniques, using the 640k large format.

The model B/shadow RAM combination can be used to store 40k of mode 0 picture data but suffers from the disadvantage of being able to store only one line in two of the picture.

Information about transmissions

Once the hardware and software are in place, it is still essential to know where to look for the data. Information for the UK is given in the box above. Overseas, write to your national meteorological service for information. They should oblige with a list of frequencies, a timetable and perhaps a brochure describing the Fax products which are available on short wave in your own electronics.

Your local hobby store is another possibility because you will almost certainly find books which contain lists of Weather Fax stations and frequencies upon their shelves, or someone there to ask advice from.

Using weather maps

The weather maps you get from the radio can be used in a variety of ways.

The Weather Fax system arose as a method of sharing data between meteorological stations across the country, but the same data is available for other users too.

At present one of the largest groups of making use of Weather Fax are sailors; marine receivers are available that allows yachtsmen to produce their own weather maps while at sea, so they can take advantage of any wind shifts and avoid approaching storms.

Within a school, a Weather Fax receiver should not be beyond the ability of a science department to construct. The interpretation of synoptic charts such as those broadcast on the GFA service from the Meteorological Office at Bracknell is a common exercise for teaching geography at the fifth-form level or above, and the immediacy gained from using the regularly updated charts should prove highly motivating for students.

Many thanks to John King for his help, advice and encouragement.

Further details about a fully documented Fax program are available from the author at Edgecombe College, College Road, Edgecombe, Bay of Plenty, New Zealand.

SOFTWARE Suitable for standard and Master Series Computers

Business	CASHBOOK Double Entry bookkeeping in memory for clubs	£13.75
	CASHBOOK Double Entry random access disc bookkeeping for clubs	£22.95
***	ACCOUNT Double Entry random access bookkeeping with credit control, statements, ledgers and analysis for business	£34.45
★★NEW**	ACCOUNT PLUS as above with data sort, auto statement generator, invoice, order quotation etc, mail shot merge etc	£57.44
	MICRO-TRADER The complete BBC accounts system. See demo disc	£230.00
	MICRO-STOCK 4000 items suitable for use with Micro-Trader	£86.25
***	RANDOM MAILING mail merge, 5 sorts, 1, 2, or 3 across labels	£34.45
***	EXTENDED PAYROLL "Impressive package - Micro User" 1.2, 4 weekly & monthly, contracted in & out, 3 overtime, personnel file, 2 payslip formats, plus, plus	£57.44
***	SPECIAL THREE STAR OFFER - ALL THREE STAR PROGRAMS	£79.95
Genealogy	FAMILY TREE 340/750 people 100/250 marriages. Ancestral, descendant & family tracing with full tree printout, sorted list. Review in Feb Issue	£19.95
Statistics	STATPACK the stats package for students, 30 results	£13.75
ROMS	CARETAKER utility "If you write BASIC you need it"	£29.90
	PRINTMASTER utility "Beats the best!"	£29.90
★★NEW**	INTER-BASE The latest ROM from Computer Concepts	£49.95
	INTER-CHART data display "Quite clever - well very clever"	£29.99
	INTER-SHEET spreadsheet "Not bad! - it's the best!"	£44.99
	INTER-WORD "The WISIWYG super wordprocessor I use & teach"	£47.00
	SPELL-MASTER The fastest, largest spelling checker anywhere	£49.95
	WORDWISE PLUS Programming facilities that others haven't got	£44.99
	SYSTEM DELTA "The cleverer than clever program language database"	£62.95
	SYSTEM DELTA extended programming language manual	£19.95
EPROMMERS	EPROMS 27128 16k	£3.25
	UVIPAC Eprom Programmer 8 & 16k £20.95 32k Programmer	£20.95
	UVIPAC Eprom Eraser £20.95 Toolkit Eprom Software	£7.95
COMPUTERS	AMSTRAD PCW8512 complete with printer & software	£429.95
	AMSTRAD PC1512 Dual Disc Drive Mono complete with £200 software	£625.00
	AMSTRAD PC1512 Dual Disc Drive Colour complete with £200 software	£798.99
BBC/IBM/BBC	Full description of how to send data between the two machines	£4.95
PRINTERS	CITIZEN LSP-10 120cps NLQ 38 cps. Many features. Save £91.00	£249.00
	RIBBONS, FX, RX, LX-80, 120D, GLP, Amstrad, Shinwa from	£3.50
	PRINTER CABLE Suitable for BBC/Electron to parallel printers	£7.95
DISCS	DISC DRIVE 800k Opus twin double sided	£215.00
	DISCS 5.25" Double sided & density 40/80 tracks. 5 colours in box	£10.95
LISTING PAPER	Box 2000 fanfold perforated 11" x 9.5" 60 gsm (None cheaper?)	£12.95
	Box 2000 fanfold micro-perforated A4 80 gsm (None better?)	£22.95
LABELS	For Mailing 1000 1 across 3.5" x 1.4375	£6.50
	For Mailing 2000 2 across 3.5" x 1.4375	£11.95
	For Mailing 1000 3 across 2.75" x 1.4375	£6.50
	For Disc labelling 1000 1 across 5" x 15/16"	£4.95

AUSTRALIA Come with us to the Australian Computing Exhibition from 8-10 September

Ask for brochure for more software and further details
Prices include VAT. Add 57p for p/p. Printers add £9.95

MICRO-TRADER

INTEGRATED SALES PURCHASE AND NOMINAL LEDGERS

Designed for business use by a business man programmer. "Micro-Trader" is a fully integrated program in which all Sales and Purchase Ledger transactions are automatically updated to the Nominal Ledger.

"Micro-Trader" offers full Sales and Purchase Ledger facilities including SALES INVOICE and STATEMENT PRINTING with a capacity of 450 accounts and 3000 transactions per month in each Ledger.

Normal Income Expenditure, Assets, Liabilities & Journal Posting in the Nominal Ledger with full Reporting for individual accounts, Audit Trial, Trial Balance, Profit & Loss and Balance Sheet.

This suite is the only accounts package a real business needs to keep, maintain and finalise its accounts. If you are seriously in business consider how much time and money you spend and lose because you are not an accountant. You are a business man and so am I. You have a computer and so have I, all you now need is "MICRO-TRADER" to let you get on with running your business. I have already got it.

"MICRO-STOCK" would be an asset if you purchase goods in your business. It is a Stock Control program, fully integrated with "Micro-Trader". 4000 Stock Items with user defined codes. Invoice and Credit Notes and Cash Sale routine. Full Stock Held Reports.

EXTENDED PAYROLL solves the wages problem. We have been supplying payroll programs since 1982, a year longer than anybody else for the BBC. People trust us.

Micro-Trader £200.00: Micro-Stock £75.00: Extended Payroll £49.95

Ring Colin Chatfield, Fellow of the Institute of Analysts and Programmers, for more information. He will be pleased to advise which, if any, of these programs you need.

To the Trade - If you are interested in selling the best business programs for the BBC you could do worse than ring us.

Micro-Rid

(AU), 25 Fore Street, Praze;
Camborne, Cornwall TR14 0JX
or telephone 0209-831274 with ACCESS
or PRESTEL *2582020

Archimedes

SUBSCRIPTION

AU OFFER

Free monthly programs



We are giving away our monthly listings discs - worth £5.95 and cassettes - worth £3.95, when you subscribe to *Acorn User* magazine. All you have to do to guarantee 12 issues of *Acorn User* and their safe delivery to you, is to fill in the coupon below and choose your favourite *Acorn User* monthly listings cassette or disc. Choose from any of the following: August '87 featuring *Calendar*, *Gus* (March '87), *Desalet* (May '87), *Super Plotter* (November '86) or even *Dodo* (August '86).

Any one of our monthly listings will be yours absolutely free, when you subscribe now.

YES! I wish to subscribe to *Acorn User* magazine starting with the _____ issue.

Please send my FREE monthly 40/80-track 5.25-inch disc or cassette for the _____ issue.
(Please allow 28 days for delivery)

NAME _____

ADDRESS _____

POSTCODE _____

I enclose my cheque/postal order for £17.50 made payable to Redwood Publishing Ltd.

Please debit my Access/Barclaycard/American Express

ACCOUNT NO: _____

EXPIRY DATE: _____

SIGNED _____

DATE _____

Please send this coupon together with your remittance in an envelope to Gail Fairhall, Subscriptions Manager, Redwood Publishing Limited, Lambourn Woodlands, Newbury, Berkshire RG16 7TW.

AUTUMN SALE PLEASE READ THIS WHOLESALE PRICES TO YOU THE USER

BUY 5.25" DISKS

Plain label by leading manufacturers, i.e. R.P.S., Wabash etc.

	25	50	100	200	500
SS/SD 48TPI	£10.00	£19.00	£35.00	£68.00	£164.00
SS/DD 48TPI	£10.50	£20.00	£38.00	£74.00	£174.00
DS/DD 48TPI	£11.00	£21.00	£40.00	£78.00	£190.00
DS/DD 96TPI	£11.50	£22.00	£42.00	£82.00	£200.00

All above inc. envelopes, labels sets and hub rings
UK MADE Library cases bought with above only £0.95p EACH

Special Offer:

Buy 100 SS/DD 48TPI Disks without envelopes for
ONLY £33.00

3 1/2" DS/DD DISKS

Plain label. Made in Japan

	10	20	50	100	200
	£15.00	£26.00	£64.00	£110.50	£198.00

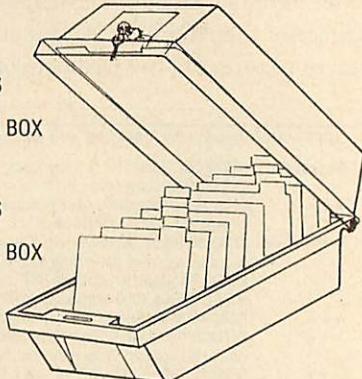
LOCKABLE DISC BOXES AND LIBRARY CASES

5 1/4" 10 Capacity REF. VIS 10 Library Case	£ 1.30
5 1/4" 50 Capacity REF. YU/DD50L	£ 7.50
5 1/4" 100 Capacity REF. YU/DD100L	£10.00
3 1/2" 10 Capacity REF. MCS 10	£ 1.30
3 1/2" 40 Capacity REF. YU/DD40L	£ 8.50
3.5" 80 Capacity REF. YU/DD80	£ 9.75

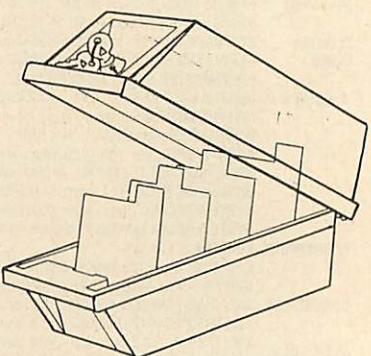
SPECIAL OFFERS

★ EXCEPTIONAL VALUE ★

25 5.25" DS-DD DISKS
PLUS
100 CAPACITY LOCKABLE DISK BOX
FOR ONLY £17.60
OR
50 5.25" DS-DD DISKS
PLUS
100 CAPACITY LOCKABLE DISK BOX
FOR ONLY £27.10



20 3 1/2" DS-DD DISKS
PLUS
40 CAPACITY LOCKABLE BOX
FOR ONLY £29.50
OR
50 3 1/2" DS-DD DISKS
PLUS
80 CAPACITY LOCKABLE BOX
FOR ONLY £68.20



**REMEMBER THE PRICES YOU SEE IS ALL
YOU PAY. THEY INCL. VAT & CARRIAGE
PRICES REFER TO UK ONLY**

CHEQUE OR POSTAL ORDER TO:

Manor Court Supplies Ltd



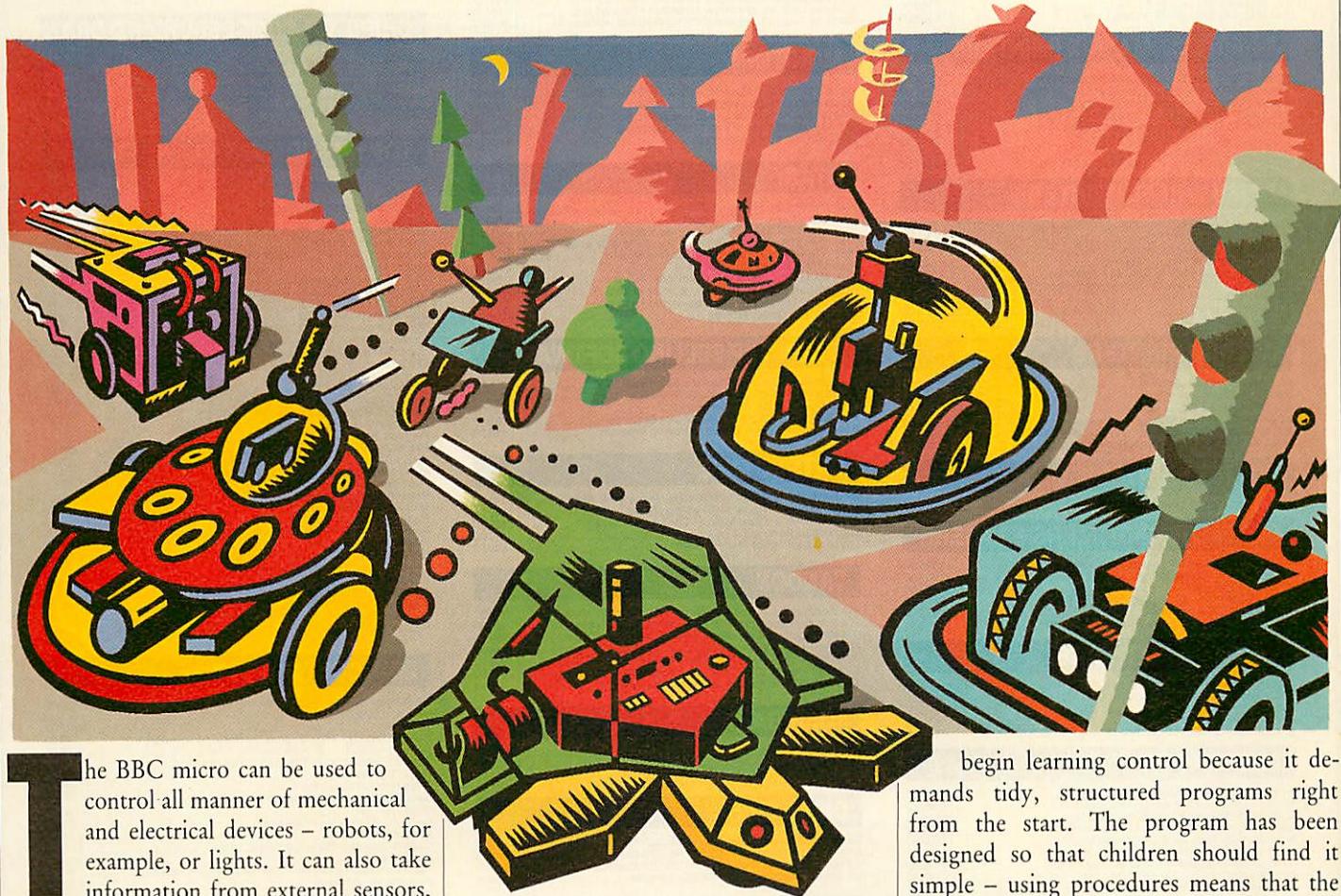
DEPT. AU10 GLEN CELYN HOUSE, PENYBONT,
LLANDRINDOD WELLS, POWYS LD1 5SY
Telephone: 0597 87784/0597 87792

ORDERS ACCEPTED FROM EDUCATIONAL & GOVERNMENT DEPARTMENTS
DEALER INQUIRIES INVITED

GAIN CONTROL

Here we present an introduction to the principles of computer control with the help of *Switch*

Peter Julian



The BBC micro can be used to control all manner of mechanical and electrical devices – robots, for example, or lights. It can also take information from external sensors, such as light detectors or switches, and use it to decide what to do.

This input and output is often achieved using the computer's user port for receiving data, and the printer port for sending it. In order to use the tiny signals from the computer for anything useful you need an interface unit, such as the Banana interface, which amplifies the signal from the computer. Learning the principles of computer control can be unnecessarily complicated by the technicalities of programming, so here is a program, designed to teach the principles involved. It can also actually be

used to control a device when the ideas involved have been grasped, so it is especially suitable for educational use.

The hobbyist who wishes to extend his or her programming expertise into the field of robotics should also find the program, *Switch*, a good starting point. Because *Switch* is written in Basic, it is fully extendable with no machine code to worry about. The ready-made functions and procedures can be put together to build more complex routines, or extra facilities can be added by adding new procedures.

Switch forms a good basis from which to

begin learning control because it demands tidy, structured programs right from the start. The program has been designed so that children should find it simple – using procedures means that the programming logic puts emphasis on the correct sequencing of command words, and it can be readily used in problem solving involving control technology.

In fact, *Switch* is two programs. The first provides a simple introduction to control, via programming traffic lights or a pedestrian crossing.

Unlike some other control systems, there are no hidden or inaccessible parts. All the routines can be examined to see how they work. This should assist the student who wishes to improve their understanding of how the routines operate.



Services
M1 Junction 6
M10 Junction 1
M25 Junction 21A

NARROW DOT MATRIX PRINTERS

Epson LX800—The Brand New Best Seller!	£193.00
Star NL10—The Number Two Seller—Best Spec	£183.00
Panasonic 1081 120cps & 80 col—Brand New!	£149.00
Panasonic 1091—Byte Magazine Says It's No 1	£228.00
Epson FX800—Brand New! 240cps! Wow!	£294.00
Epson EX800 300cps & 80 column—Super Fast	£374.00
Sekiksha MP300A1—300cps & 80 column	£299.00
MP 165—Cheap Fast and Good Quality, 80cps	£299.00
MP 135—Cheap Fast and Good Quality	£170.00
Oki Microline 182—The Number 2 Brand	£135.00
Oki Microline 192—Perennial Favourite	£181.00
Citizen MSP-10 160cps draft 80 column	£277.00
Citizen 1200—120cps draft 25cps NLO	£165.00
Citizen MSP20—200cps draft 50cps NLO	£299.00

WIDE DOT MATRIX PRINTERS

Star NX15—The New Wide-body NL10!	£288.00
Star NR15—Replaces the SR15—A Great Mover	£398.00
Panasonic 1091—The Number One Favorite	£521.00
Epson FX1000—Brand New! FX105	£385.00
Epson EX1000—300cps & 136 column—Super Fast	£420.00
Seikosha MP5300A1—132col Version of MP1300	£439.00
MP200—200cps! 132 column!	£260.00
MP201—132 column 200cps	£295.00
Oki Microline 193—Worth A Look	£359.00
Oki Microline 293—Worth A Long Look	£400.00

24-PIN DOT MATRIX PRINTERS

Epson LP800—Letter Quality—24-Pin Printhead	£420.00
Epson LP1000—Letter Quality—24 Pins—132 Col	£571.00
Epson LP2000—This one is really good!	£690.00
Star NB15—The big up-market 24-pin 300cps	£599.00
Star NB24-15—Same above but 210cps	£420.00
Star NB24-10—80 column 24-pin winner	£414.00
NEC PG—Good Buy	£379.00
NEC P7—One of the Best Sellers Ever—24 pin	£441.00

DAISY WHEEL PRINTERS

Star Power Type 18cps—The Current Cheap One	£179.00
Juki 6100—20cps—Very Popular	£254.00
Juki 6200—30cps—Still Popular	£394.00
Juki 6300—Very Up-Market	£642.00
Juki 6500—60cps—Heavy Duty and Very Fast	£958.00
Qume Sprint 1190—90cps Daisywheel Printer	£1200.00
Citizen HQP-45 45cps	£399.00
Citizen Premier-35	£510.00
Brother HR25	£549.00

COLOUR PRINTERS

Okimate 20 Thermal Printer	£159.00
Juki 5520—The Market Leader—Fast!	£335.00
Epson EX-Series Colour Option	£55.00
NEC P500—Heavy Duty Office Favorite!	£740.00
Epson LO2500 Colour Option—Includes LO2500 Colour	£65.00
Seikosha MP1300 Colour Kit/Makes MP1300 Colour	£87.00

INK JET PRINTERS

Epson SQ2500—Ink your jet with this one!	£974.00
--	---------

PLOTTERS, DIGITIZERS & LASERS

New Ohi Laserline 6—6 pages per minute	£1399.00
HP LaserJet II—Newer, Better, Cheaper!	£194.00
Cherry A3 Digitizer	£475.00
Roland DXY-880A Plotter—Best Value A3 Plotter	£690.00
Roland DXY-990A Plotter	£923.00
Epson QG3500—Brand new Epson best-seller!	£1359.00

CABLES AND THINGS

IBM-Compatible Centronics Parallel Cable (Round)	£12.00
BBC Centronics Parallel Cable (Ribbon)	£8.00
Two-Way Printer T-Switch	£45.00
80 Col Printer Stands	£21.00
SpaceBase Adjustable Floor-Standing Printer Stand	£85.00

AMSTRAD PC

Amstrad 1512 Single Floppy/Mono Monitor	£415.00
Amstrad 1512 Double Floppy/Mono Monitor	£525.00
Amstrad 1512 Double Floppy/Colour Monitor	£555.00
Amstrad 1512 Single Floppy/Colour Monitor	£666.00
Amstrad 1512 20mb Hard Disk/Mono Monitor	£837.00
Amstrad 1512 20mb Hard Disk/Colour Monitor	£959.00
Amstrad 1640 Single Floppy (EGA Colour 640k)	£749.00
Amstrad 1640 Double Floppy (EGA Colour 640k)	£849.00
Amstrad 1640 20mb Hard Disk (EGA Colour 640k)	£1129.00

EPSON PC'S

Epson PC AX-20 at 640K RAM, 1.2mb Floppy, 20mb HD	£1499.00
Epson PC AX-40 at 640K RAM, 1.2mb Floppy, 40mb HD	£1899.00
Epson PC AX-60 at 640K RAM, 1.2mb Floppy, 60mb HD	£2399.00
Epson PC AX-80 at 640K RAM, 1.2mb Floppy, 80mb HD	£2799.00
Epson PCe	£1050.00

FOR FULL PRICE LIST PLEASE CALL
 TELEPHONE ORDERS WELCOME

0727 - 37451 / 72790

TELEX: 895011 ONE ONE G (Quote Ref: 15412001)

OFFICE AND WAREHOUSE • UNIT A • CAXTON CENTRE • PORTERS WOOD • ST ALBANS • HERTFORDSHIRE • AL3 6XT • (0727) 37451
 COMPUTER EXPRESS HOLLAND • NIJVERHEIDSWEG • N60 • 3812 PM • AMERSFOORT • NETHERLANDS • (33) 630544

MACDOUGALL PC'S

MacDougall 286 AT 512K 10mz/20mb HD/mono monitor	£999.00
--	---------

OLIVETTI PC'S

Olivetti M28 AT Compatible—20mb Hard Disk	£183.00
Olivetti M28 20mb Hard Disk with 20mb Tape Back-up	£229.00
Olivetti M28 40mb Hard Disk, 640K RAM	£232.00
Olivetti M28 40mb Hard Disk with 20mb Tape Back-up	£279.00
Special Offers:	
Olivetti M24 20mb Hard Disk Mono	£1299.00

SHARP PORTABLES

Sharp PC7100 20mb Hard Disk SuperTwist Screen	£1399.00
Sharp P7200 20mb 80286 AT SuperTwist & SuperFast	£1209.00

COMPAQ

Compaq Portable III Model 2 640K/20MB HD	£2914.00
Compaq Portable III Model 3 640K/40MB HD	£2324.00
Compaq Pro 286 Model 20 640K/FD/20MB HD	£1261.00
Compaq Deskpro 286 Model 40 640K/FD/40MB HD	£2536.00
Compaq Deskpro 386 Model 40 1024K/40MB HD/Tape BK	£3999.00

MONITORS

Dynex 12in 12MHz Mono Monitor & Tilt/Swivel Stand	£99.00
Taxxon K12V3 Supervision III Colour Monitor	£359.00
Eizo ER8042S 14in Ultra-High Res EGA Colour Monitor	£445.00
Adonit Mono Monitor with Tilt/Swivel Stand	£120.00
NEC Multisync EGA Monitor	£489.00

ATARI

Atari Expandable PC Twin Drive Mono	£57.00
Atari Expandable PC 20mb Hard Disk Mono	£79.00
Atari 520STF 512K RAM, disk drive, mouse	£920.00
Atari 1040STF with Mono Monitor, 1mb RAM, disk drive	£523.00
Atari 1040STF with Atari SC1224 Colour Monitor	£720.00
Atari SH204 20mb Hard Disk Drive	£478.00
Atari Mega ST (2 mega byte), with mono monitor	£810.00
Atari Mega ST (4 mega byte), with mono monitor	£1050.00
Atari SM125 High Resolution Monochrome Monitor	£114.00
Atari SC1224 Colour Monitor	£296.00

ATARI TOP SELLING SOFTWARE

Flight Simulator II—Very Realistic Best Seller	£36.00
VIP Professional (Lotus Clone Gem Version)	£149.00
Metacomo Lattice 'C' Compiler	£71.00
First Word Plus—Word Processor with Graphics	£62.00
Easy Draw II—The Professional Drawing Program	£58.00

CATS 'N' MICE

Mouse Systems Mouse with Pop-Up Menus & PC Paint	£145.00
Mouse Systems Mouse with Pop-Up Menus only	£125.00
MicroSoft Bus or Serial Mouse—Don't forget the cat!	£132.00
Logitech Logimouse C7	£170.00
Logitech Logimouse Plus Package	£89.00

TANDON

TANDON 20mb Hard Disk AT (1mb RAM Keyboard DOS Monitor P+S Ports)	£1345.00
TANDON 20mb Hard Disk AT (1mb RAM Keyboard DOS Monitor P+S Ports)	£1569.00
TANDON 40mb Hard Disk AT (1mb RAM Keyboard DOS Monitor P+S Ports)	£1789.00
TANDON 70mb Hard Disk AT (1mb RAM Keyboard DOS Monitor P+S Ports)	£2145.00
Target 20 Mini AT (Complete Mono System)	£1599.00
Target 40 Mini AT (Complete Mono System)	£1814.00
Tandon NEW! Removable Hard Disk Pac system!	Call

TOSHIBA

Toshiba T1000 Plus	£1299.00
Toshiba T1200	£1850.00
Toshiba T3100 (20mb Hard Disk AT Portable)	£2550.00

DISKETTES

Computer Express 5.25in DS/DD 48pi disks	£1.00 each
Computer Express 5.25in DS/DD 96pi Hi-Density	£1.85 each
Computer Express Branded 3.5in DS/DD diskettes	£1.99 each
Un-branded Verbatim 3.5in SS/DD diskettes	£1.15 each

COMMUNICATIONS

Miracle WS4000 V21/V23 Modem	£139.00
Miracle WS4000 V22 Professional Modem	£385.00
Sage ChitChat Comms Pack (Modem/Software/Cable)	£199.00
Sage ChitChat Comms Software	£71.00
One-To-One Electronic Mail Subscription	£15.00
RS232 serial modem cable	£39.00

SPECIAL OFFERS

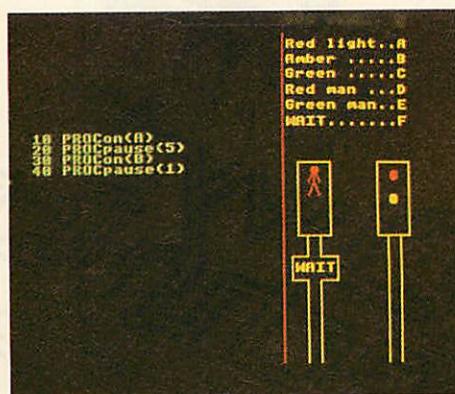
Migent Ability	£50.00

<tbl_r

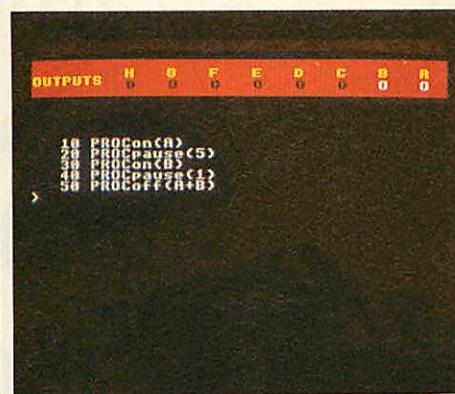
New facilities

It is possible to create completely new facilities to add to the procedures already built in to *Switch*. For instance, a new function could be added to read the analogue port. Light-dependent resistors or other sensors can be connected, and will increase the versatility of the control system. Initial experiments with the analogue port could involve instructing the computer to make different responses according to the light level measured by a light-dependent resistor.

Each of the programs has a display showing the current state of the outputs from the computer – whether they are on or off. The output routines are all in Basic, and can be modified if necessary. There is no display on screen showing the current state of the inputs used by the program, as continually updating the input display would involve a complex interrupt routine in assembly language. Producing this type of input display could form part of a more advanced programming project.



Practice with the traffic lights



Then move on to external devices

followed by the letter name of the output. The red light is output A, so the first line of the program could be:

10 PROCon (A)

The function keys are pre-set with several of the most common commands. These are marked on the function key strip. The red keys can be used to reduce the amount of typing to a minimum.

If more than one output is to be switched on at one time, then:

10 PROCon (A + B)

can be used.

To switch off an output, PROCoff can be called in a similar way to PROCon:

10 PROCoff (A + B)

switches off both the red and yellow lamps.

Any commands to switch on an output that is already on are ignored. If more than one output is to be switched on, and any one is already on, then the command is ignored. So:

10 PROCon (A)

20 PROCon (A + B)

will not switch on lamp B. The same effect also applies to PROCoff.

The third vital procedure is PROCpause. This allows the program to wait for a preset time, to introduce a delay between actions. To wait for five seconds, you can use:

10 PROCpause (5)

To program the simplest traffic light sequence, first run listing 1 and then type in the

program in box 2. Then run it by typing RUN or pressing the function key.

Other procedures

Listing 1 offers several other procedures to control the lamps. PROCreset will switch off all the outputs. It can be used within a program, or it can be used if a program has to be stopped half-way through by pressing Escape. This can leave some lamps on, so PROCreset sets them all to off. If you are using *Switch* with an interface unit, to control a buggy or turtle for example, pressing Escape may leave the motors running. However, pressing function key 0 uses PROCreset to avoid this problem by stopping all the motors.

PROCbutton causes the program to wait until the space-bar is pressed. This is vital because the pedestrian crossing sequence should only start when a button by the roadside is pressed. PROCbeep makes a beeping sound to simulate the crossing.

The functions of the red keys are printed on the keystrip. With commands such as PROCon, the command and first bracket appear on screen, but you have to type in the letters corresponding to the lights to be switched plus the closing bracket yourself. Some other commands such as PROCbeep don't appear on the keystrip, and have to be typed in full. If you make a mistake typing in a line, just type it again.

Interface unit

The advanced version of *Switch*, in listing 2 on the yellow pages, offers the same set of procedures as the traffic light program, plus other facilities. The first is PROCtest, which can be called by pressing function key 9. PROCtest allows the input sensors to be checked – an on-screen display shows which inputs are on and which are off, and this should change if the sensor switches are changed or light-dependent resistors are shaded. To end the test, press the space bar. PROCtest should not be used with a program, just for debugging.

In contrast, FNinputon is a function to test whether a particular input to the interface box is on or off within a program. This is usually incorporated into a Basic 2 statement such as:

```
10 IF FNinputon (A) THEN PROCbeep
```

This will cause a beep only if input A is on. Unlike PROCon, this can't be used with more than one input. If two inputs are on then use:

```
10 IF FNinputon (A) AND FNinputon (B) THEN PROCbeep
```

OFF-BOARDS FOR ELECTRONIC SYSTEMS DESIGN

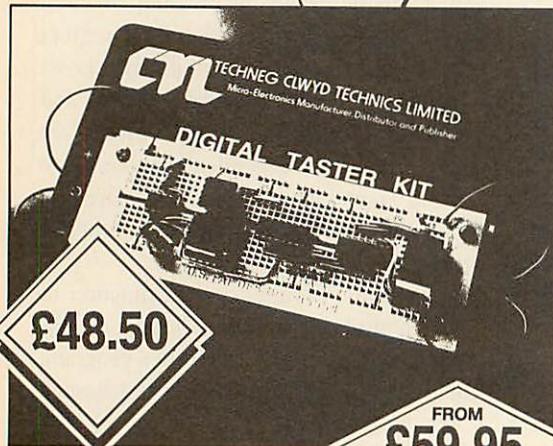
An exciting development in the field of educational microelectronics. Unlike other 'push together' systems boards with limited flexibility, you'll find the OFFBOARDS truly open-ended, ideal for design problem solving. They provide an essential stepping stone to the complexities of pure breadboarding. With the OFFBOARDS you can introduce a component-based approach without the usual drawbacks of lost time on

simple wiring faults. Each of the ten OFFBOARDS consists of a small PCB with a set of Veropins fitted to one end. These can be pushed into a standard I.C. type breadboard, and powered up to provide a useful systems function. The Veropins of the OFFBOARDS mate with the sockets of the breadboard, and pupils can investigate the circuits sub-systems by using the breadboard to interconnect and adding components.



DIGITAL ELECTRONICS TASTER COURSE

Provides an inventive and stimulating introduction to digital electronics. The six-hour course, with its guided discovery approach, offers pupils valuable practical experience in handling microelectronic components. Secondary teachers contributed to its design, and helped with trialling.

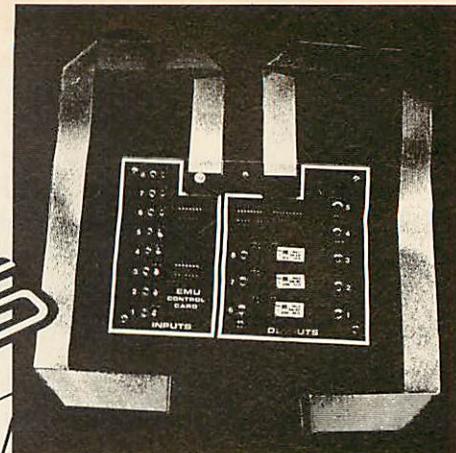


FROM £59.95

The taster course contains a reusable self-contained kit, requiring no special environment or mains supply. It allows teachers with little or no previous knowledge to create the first awareness of modern micro-electronic technology, and stimulate an interest for further studies. Some of the areas covered by the course include recognition and use of resistors and capacitors, current flow, a lamp flasher circuit with audible alarm, binary to decimal conversion with automatic/manual counting and decimal display.

BBC MICRO INTERFACING COURSE

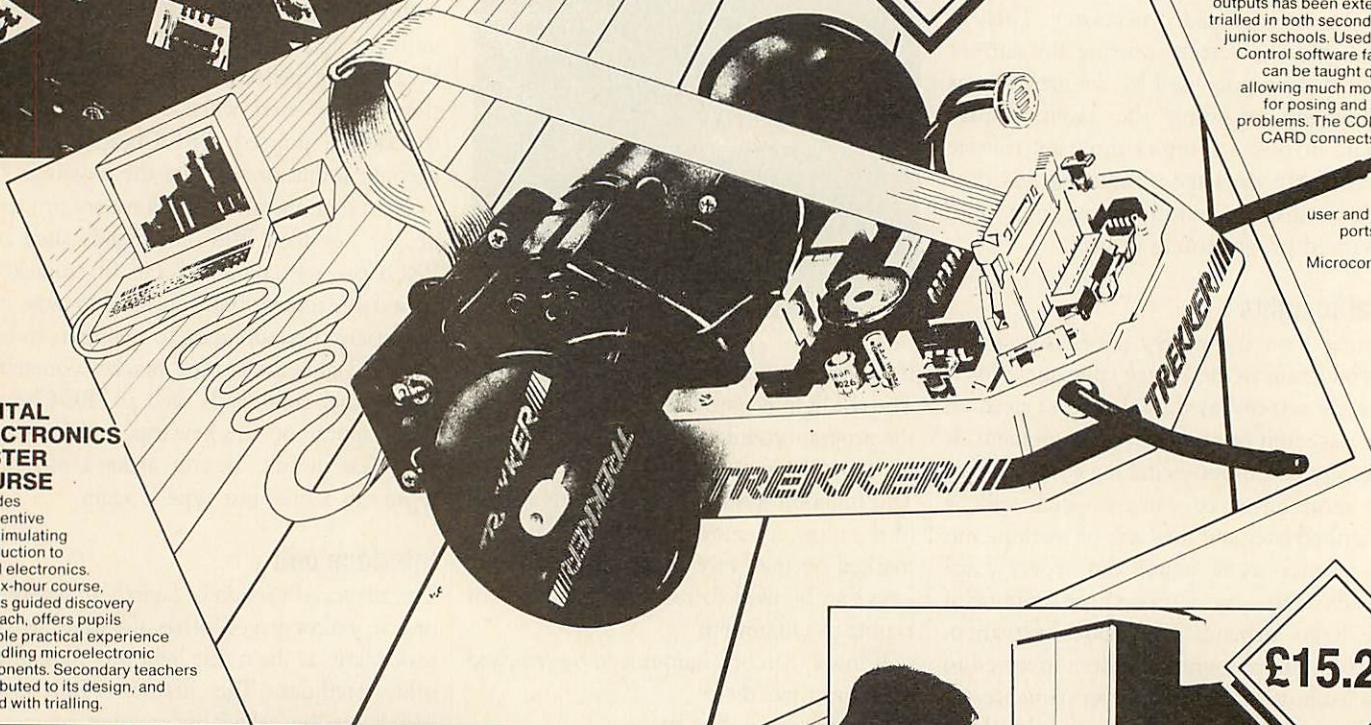
An inexpensive guide to using the BBC Micro-computer as a monitor/controller of various devices. The eight-hour course follows a set of Pupil Worksheets, from BASIC program writing to controlling the 'loco' of an N-gauge model railway. Central to the course is the versatile interface card, with 19 in/out sockets, which connects the BBC Micro-computer user port.



CONTROL CARD

Another very useful tool for problem solving exercises and computer control studies, the CONTROL CARD will shortly be available alongside other group products. Ideal for introducing the computer as a device controller, and solving problems in a control environment. The PCB CONTROL CARD with eight inputs and eight outputs has been extensively trialled in both secondary and junior schools. Used with In Control software facilities can be taught quicker, allowing much more time for posing and solving problems. The CONTROL CARD connects to the

user and printer ports of the BBC Microcomputer.



TREKKER

The complete educational robotics package. Designed by a teacher for other teachers to use in their classrooms, TREKKER is supplied ready-built with a complete survival pack of courses on computing, electronics and robotics. Just plug into your BBC user port, and start in less than three minutes. TREKKER is the best way to introduce new technology into the curriculum. No programming knowledge is required as the pack includes 44 ready-to-use software programs. Applications range from geometry to electronics, white line following to bar codes, and from music to distance measuring. TREKKER embodies components, circuits and design techniques from public syllabuses in Control Technology, Modular Technology, Electronics and Robotics. If you want to be in control of technology, keep on the right track with TREKKER.



PRINTED CIRCUIT BOARD DESIGNER

Designing printed circuit boards with computer aided design provides many advantages for both teacher and pupil. It's quicker, cheaper and easier to use than traditional tape and transfer methods. Using the PRINTED CIRCUIT BOARD DESIGNER the layout can be changed at any stage of the design. Good physical co-ordination is no longer necessary to

produce a neat and accurate p.c.b. mask. Once you've used this program to design a p.c.b. you'll soon be attempting more and more complex circuits. Tapes, transfers and strip-boards will become things of the past. The dot-matrix printouts of your designs can be used to make either single or double sided printed circuits.

CLWYD TECHNICS LIMITED

Clwyd Technics Ltd
Antelope Industrial Estate
Rhuddlan, Mold, Clwyd CH7 5JH
Telephone: Hendre (035283) 751

Educational prices quoted, excluding V.A.T.

FNout is similar, but it allows you to test whether a particular output is on or off.

Combined with REPEAT and UNTIL, these functions can form a wait command:

```
10 PROCon (C)
20 REPEAT UNTIL FNinputon (A)
30 PROCOFF (C)
```

This keeps output C on until input A comes on, then C is switched off. So this sequence could control a buggy motor for example, driving the buggy forward until it hits something. Most buggies have a bumper on the front which can detect when something is hit, and the input from the bumper could then be used to turn the motor off.

Another application for REPEAT would be to sound a warning:

```
10 REPEAT
20 PROCbeep
30 PROCPause (0.5)
40 UNTIL NOT FNinputon (A)
```

The beep keeps repeating at half-second intervals until the input A is not on.

Function keys 7 and 8 are used in FOR loops. Key 7 starts the loop – all that has to be added is the number of times the loop should run. So to beep five times, the following should be used:

```
10 FOR x = 1 TO 5
20 PROCbeep
30 PROCPause (0.2)
40 NEXT
```

NEXT appears on function key 8.

Procedures

As *Switch* is written in Basic, all the facilities of Basic are available for constructing your own procedures. These can comprise facilities we've already described, or they may be more sophisticated, perhaps to allow access to the analogue port. The beeper loop above can be rewritten as a procedure like this:

```
1000 DEF PROCbeeper
1010 FOR x = 1 TO 5
1020 PROCbeep
1030 PROCPause (0.2)
1040 NEXT
1050 ENDPROC
```

The definition of the procedure must come after the main part of the program, so it's best to use line numbers from 1000 upwards. This procedure idea can be tried out within the pedestrian crossing sequence to give the noise made by a pelican crossing while the green man is illuminated. To use the beeper procedure, just use PROCbeeper in the main part of the program just as if it were a built-in procedure.

Numbers can be passed to the new procedures that you write yourself. The beeper mentioned always beeps five times:

BOX 1. AVAILABLE ROUTINES

PROCon (n)	Switches on output n
PROCOFF (n)	Switches off output n
PROCreset	Switches off all outputs
PROCpause (n)	Waits for n seconds
PROCbeep	Beeps
PROCbutton	Waits for space-bar press
FNinputon (n)	True if input n on
FNout (n)	True if output n on
PROCtest	Test inputs

BOX 2. TRAFFIC LIGHTS PROGRAM

```
10 PROCon (A)
20 PROCpause (5)
30 PROCon (B)
40 PROCpause (1)
50 PROCOFF (A + B)
60 PROCon (C)
70 PROCpause (5)
80 PROCOFF (C)
90 PROCon (B)
100 PROCpause (1)
110 PROCOFF (B)
120 PROCon (A)
```

you could rewrite it so that you can control the number of beeps, like this:

```
1000 DEF PROCbeeper (T)
1010 FOR x = 1 TO T
1020 PROCbeep
1030 PROCPause (0.2)
1040 NEXT
1050 ENDPROC
```

and then use it with PROCbeeper(3) if you only want it to beep three times.

When the main ideas of control programming have been mastered with the traffic light sequence or a buffer box and simple lights, the scope can be extended to control motors on a simple robot such as a turtle or buggy. Usually they can be connected to the interface so that the outputs control the main motors of the buggy, and perhaps a horn or pen arm. Inputs come from collision sensors, or maybe light or heat sensors.

Procedures could be built up to make the buggy go forward for a certain time, turn left and so on: perhaps it could be programmed to turn away from areas where darkness was detected by the light sensor.

Using this simple pair of programs as a basis, it should be possible to build up a complete control system. The use of an interface unit opens up the whole area of computer control – consider for instance all of the electrical devices and fittings in your home which could be run by your micro. Your BBC need not be limited to dealing with numbers and words.

Turn to the yellow pages index on page 113 for details of the *Switch* listings.

EXTERNAL SWITCHING	RESET	ON	OFF	PAUSE	LIST	RUN	INPUT	FOR	NEXT	TEST
TRAFFIC LIGHTS	RESET	ON	OFF	PAUSE	LIST	RUN	INPUT	FOR	NEXT	HELP

Keystrip to use with *Switch*

TELETEXT ADAPTER

Would you like access to free high quality software and over a thousand pages of information, but Prestel access charges and phone bills too expensive? Then read on!

The answer is Teletext. Yes the same system everyone has seen incorporated into television sets, but with a difference. When Teletext is read by a computer you can actually use the data.

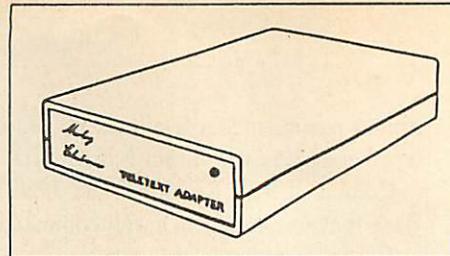
The MORLEY TELETEXT ADAPTER introduces you to the world of Teletext at a price that won't break the bank. Inside it you will find the latest in second generation Teletext chip technology, which unlike our rivals who are still using chips designed more than ten years ago, will be fully compatible with any future advances in the Teletext system.

With the Morley adapter you will get a state of the art unit that automatically tunes itself into the required station (no more messing around with screwdrivers or twiddling little knobs in the back of the case), a user friendly menu driven program, easy to follow instructions and a 12 month warranty. Add to this the free downloadable telesoftware and we are sure that you will agree that we are offering you one of the best bargains on the market today.

FEATURES:

* Advanced design uses the latest technology, will handle ANY future enhancements to the Teletext

system e.g.: full field; 8 bit data transfer; 2k pages etc.
* Simply plugs into the user port.
* Low power consumption, less than 200mA.
Optional power supply available.
* User friendly menu driven software including extended OSCLI and OSWord commands for access from BASIC programs.
* Supplied with 16k ATS (Advanced Teletext Software) and 16k support ROM software inc. printer dumps, page spoolers etc.
* FREE Telesoftware, no access charges (updated weekly).
* Save selected pages to disc/tape for later retrieval.
* Full access to all Teletext services and channels e.g.: CEEFAX, ORACLE, 4-TEL.
* Gives you a real-time clock at your disposal (*TIME).
* Software upgrades to allow for any enhancements to the Teletext service, e.g.: extra channels, full field data on cable & satellite systems etc. (only the media charge).
* Easy to follow comprehensive user guides.
* No hardware limitations, it can for example receive virtually unlimited numbers of channels.
* Util disc available including printer drivers allows pages to be selected and dumped direct to a printer



(no more TV or Radio Times to buy).

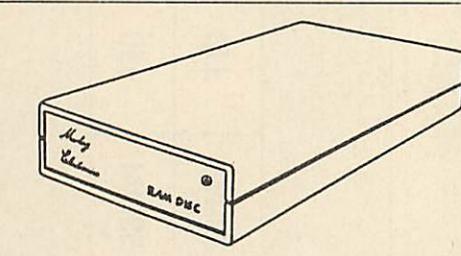
WHAT THE REVIEWERS SAID:

"...in terms of price, performance, future expansion possibilities and those little touches that show thought for the end user I would recommend the Morley unit."—(Acorn User, January, 1986).

"...The Morley unit has been designed to ensure that its operation is simple and smooth. It is the ideal Teletext adapter for school use."—(A&B Computing, June, 1986).

"...Using it over a number of months in different schools, it has proved utterly reliable, and may confidently be recommended."—(The Times Educational Supplement, September, 1986).

THIS IS THE BIGGEST SELLING TELETEXT ADAPTER CURRENTLY IN PRODUCTION WORLDWIDE, AND COMES WITH A FULL MONEY BACK SATISFACTION GUARANTEE.



Now available! The first true MEGA capacity RAMdisc for the BBC, BBC B+ and MASTER computers. This fully compatible unit, currently available in either 1 or 2

megabyte versions comes complete with operating software on ROM, power supply, and a comprehensive user guide.

FEATURES:

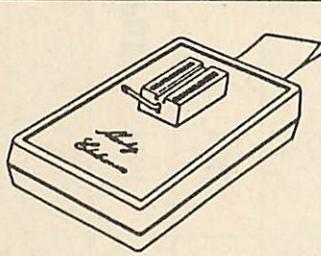
One megabyte of RAM connected to the 1MHz bus. Used with the supplied ROM software programs and files may be saved and loaded from the RAMdisc in the same manner as from a floppy disc with a large increase of speed, for example, a 20k mode 0 screen takes about 3-4 seconds to load from disc and about 0.2-0.3 seconds to load from the RAMdisc. The RAMdisc ROM operates as a utility ROM

RAMDISC

working with the current filing system rather than as a separate filing system. Therefore ensures compatibility with any Acorn compatible DFS (not ADFS). The RAMdisc can be selected by a * command to take the place of any drive number from 0 to 9. If the RAMdisc replaces a floppy drive as 0 for example, all commands addressed to drive 0 will be intercepted by the RAMdisc. The default drive number is 4. Any 'Dangerous' * commands such as *COMPACT, *COPY, *BACKUP etc can be intercepted and the BBC's RAM from page 2 to &7FFF saved to RAMdisc workspace, and may be recovered using a *command. This prevents accidental corruption of any programs/data in RAM you may have been using at the time. The filing system wedge ROM supplied supports load/save, byte file access, all relevant OSFSC commands, and contains a formatter verifier and 'sector' editor for use with the RAMdisc. Catalogue structure allows up to 2,688 files.

Well that's the spec., add to this our usual 12 month no quibble guarantee and we're sure you'll agree the Morley RAMdisc is the sensible alternative if increased storage capacity and speed is your requirement.

EPROM PROGRAMMER V2



The MORLEY EPROM PROGRAMMER V2 is a small self contained unit that plugs into the BBC or MASTER user port. It comes with a high quality ZIF (zero insertion force socket) and contrasting plastic case. Also included in the package is its own user friendly menu driven software on ROM or disc.

This state of the art unit, allows programming of 2764 (8k), 27128 (16k), and 27256 (32k) EPROMS. Not only does the hardware allow

programming of the usual NMOS devices, but will handle the new generation CMOS equally as well, and with the average time taken to program a 16k at less than 30 seconds we believe it to be one of the fastest programmers available today.

THE HARDWARE

The Unit is completely under software control, there are no knobs or switches to baffle the novice, and the extended features provided should excite the pro's.

THE SOFTWARE

The comprehensive user friendly software included in the package has two main parts, the first allows EPROMS to be read, programmed, verified and edited, also allowing a ROM image to be loaded or saved to disc. The second is a full ROM management system in its own right, which has a host of useful features and routines, such as KILL and RESURRECT ROM to disable or enable a sideways ROM, dump ROM image to buffer or disc, move ROM image in buffer to sideways RAM, and VIEW-SEARCH any sideways ROM.

The whole system is available now for less than the price of one WORDWISE chip. So get yourself the all new MORLEY EPROM PROGRAMMER V2 today and start using those expansion boards for what they were made for! ROMS. Immediate delivery no quibble 12 month guarantee.

MASTER CARTRIDGE

Designed and manufactured by Care Electronics to Acorn specifications. These high quality Master expansion cartridges will take two 16k sideways ROMs, and will, unlike similar cartridges available from other manufacturers, accept the new second generation programs, such as Computer Concepts Interword and Spellmaster ROMs.

These Cartridges come in a high quality, robust, formed-plastic case, that fits neatly into either one of the Master's cartridge slots.

MASTER SMART CARTRIDGE

This device was designed and manufactured jointly by Morley and Care Electronics.

The Smart cartridge will at the press of a button halt any program running in memory and execute any one of a host of useful built in, or user defined procedures, and once completed will return to the program and continue where it left off. The only limiting factor with this device is the programmers imagination. The Smart cartridge will prove useful to the novice, allowing him to do the simple things like dump any screen to printer, and make backups of protected tape or disc based software, but has an open ended specification for the advanced 'HACKER' allowing advanced programming techniques to be incorporated into almost any program at the touch of a button.

BUILT IN FEATURES (at the press of a button)
Autosaves computer's entire memory.

Freeze program at any point.

Screen dump (any mode) to printer or disc.

Allows any OSCLI command without disturbing memory.

Copies 90% of protected software.

Tape to disc, disc to tape.

User friendly menu.

Sound On/Off.

12 MONTH NO QUIBBLE WARRANTY
ALL CARTRIDGES COME WITH A

NEW

MORLEY MASTER BOARD 'AA'

At long last the add-on all MASTER users have been waiting for, an internal ROM board.

No more need to turn the computer off to insert the cartridge containing the ROM you need to debug the program in memory.

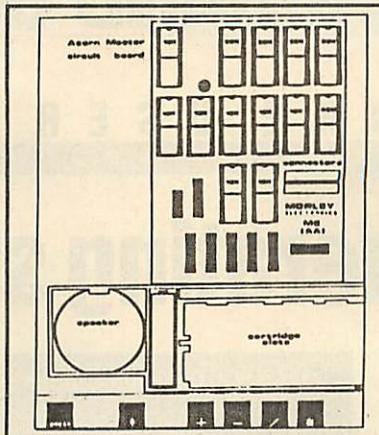
The new MORLEY MASTER BOARD "AA" allows you to have up to 8x16k and 4x32k extra ROMs installed inside your MASTER and still leaves the cartridge slots free. This in effect allows your MASTER to support as many as 24, 16k ROMs installed permanently, whilst retaining the standard 4 x sideways ram banks and four banks by using cartridges.

A staggering 32 ROM images installed and accessible at any time

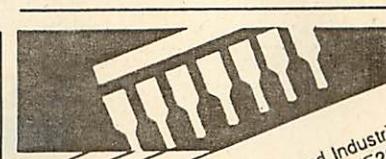
Included in the package is a utility ROM which has many useful features such as 'FICOPY', a clever file transfer program that transfers files between DFS and ADFS formats or vice versa.

So for less than the price of four external cartridges you get a MASTER BOARD "AA" which with twice the capacity has got to be THE ROM expansion for the serious MASTER user.

The unit comes with the usual Morley, full no-quibble twelve months warranty, and our usual after sales service



MORLEY
ELECTRONICS



Unit 3, Maurice Road Industrial Estate,
Wallsend, Tyne & Wear NE28 6BY
Telephone: Tyneside (091) 2627507
Telex: 265871 AB MONREF G
(Quoting Mag 70211)

THE COMPLETE RANGE OF TELETEXT SOFTWARE from M/B SOFTWARE

***NEW...DESIGN 7 PLUS** - now 'the best' is even better. Held in high regard by reviewers and hundreds of satisfied owners, DESIGN 7 has been further improved, with revised keystrip & even more features. Design/load/save and MODE 7 screen with ease, up to full CEEFAX/Oracle standard. Will convert ANY MODE 7 screen to a BASIC procedure, for inclusion in your own programs. ROM version includes a file copier, printer dumps useable from BASIC etc. B/MASTER/COMPACT.

TELETEXT EMULATORS/SCREEN DISPLAYS/INFORMATION SYSTEMS - A complete range of teletext programs to cater for all needs, with full teletext adapter interfacing.

***NEW...DESFAX** - totally new version - streets ahead of the competition - run your own information/display system. Stores hundreds of screens on dual 80 track drives (96 screens on single-sided 40 track), with access to any screen with a SINGLE KEYPRESS. Lots of special effects - screens can scroll, slide, overwrite etc. Animation, loops, subroutines - send for details - not enough space here to even begin to describe the advanced features!! B/MASTER/COMPACT

***NEW...MASTERFAX** - 84 MODE 7 screens in memory at once. 148 screens possible with cartridge RAM. An advanced teletext/carousel program featuring SINGLE KEYPRESS or 3-digit page selection. Runs entirely from memory - no disc accesses after pages are loaded. Superb animation and other effects. MASTER/COMPACT only.

***NEW...VU-FAX** - 1000 screens and no disc accesses! Screens stored on MORLEY 1MByte RAM DISC. SINGLE KEYPRESS gives instant access to any screen (or emulate teletext). This is the ultimate MODE 7 screen management system - there is nothing else like it. MODEL B/MASTER 128.

***ALSO...MASTERcopy** - DFS/DFS, DFS/ADFS, ADFS/DFS, ADFS/ADFS file copier. Uses the MASTER 128's memory to the full to permit fast disc copying. 31 DFS files to ADFS disc in less than 2 minutes. Creates directories automatically. You will wonder how you ever managed without this program. Described by reviewers as 'unexcelled'. MASTER 128 and COMPACT's fitted with DFS ROMS.

ORDER FORM

To order simply complete and return by post enclosing your cheque/P.O. made payable to Morley Electronics, or by phone during office hours, quoting your ACCESS or VISA number.

Morley Electronics, Unit 3 Maurice Road Industrial Estate, Wallsend, Tyne & Wear NE28 6BY Telephone Tyneside (091) 2627507. Telex: 265871 AB MONREF G (Quoting Mag 70211)

ALL PRICES INCLUDE VAT @ 15%

	P&P Rate	P&P Rate	
Qty. Morley Teletext Adapters	119.95 (a)	Qty. M/B Software Design 7+	9.95 (c)
Qty. Optional Power Supply	9.95 (b)	Qty. M/B Software Desfax	19.95 (c)
Qty. Teletext Utilities on disc	5.95 (c)	Qty. M/B Software DesROM	12.95 (c)
Qty. 1 Megabyte RAMdisc	199.95 (a)	Qty. M/B Software Mastercopy Disc	12.95 (c)
Qty. 2 Megabyte RAMisc	349.95 (a)	Qty. M/B Software Mastercopy ROM	14.95 (c)
Qty. Eeprom programmer V2	34.50 (b)	Qty. M/B Software Masterfax	29.95 (c)
Qty. Master ROM boards "AA"	45.95 (b)	Qty. M/B Software VU-Fax System inc RAMdisc	249.95 (a)
Qty. Master RAMdisc/SWR cartridge	P.O.A.	Qty. 5.25" Floppy discs x 10	7.95 (c)
Qty. Care Master ROM cartridges	8.95 (b)	Qty. 27128 16k CMOS EPROM	3.65 (d)
Qty. Master Smart cartridge	39.95 (b)	Qty. Info Pack + Demo Disc of all Software	FREE (c)

Please delete: Adapter software on ROM/Sideways RAM format/Software on 40/80 track disc

Name _____ Phone no. _____

Address _____ Post Code _____

Cheque No. _____ Access/Visa No. _____ Amount £ _____

Please add Postage and Packing @ a=£3.00 b=£2.00 c=£1.00 d=£0.65 (when ordering more than one item, add P&P. on highest rate item only)
GOVERNMENT, LOCAL AUTHORITY, AND TRADE ORDERS WELCOME. Please allow 28 days for delivery

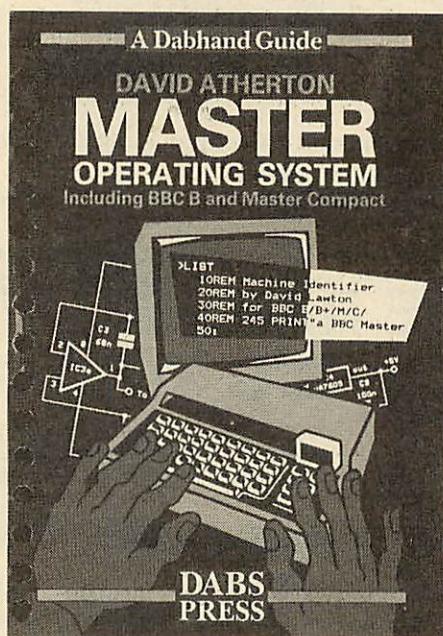


AU10

DABHAND GUIDE

ACORN USER OFFER

Master operating system guide



This is the only advanced user guide for the Master 128, from Acorn expert David Atherton. It also covers the BBC model B+ and Master Compact, and there is much for the model B and Electron programmer. David Atherton has produced a definitive reference work which serious programmers cannot afford to be without.

The book covers all features of the Acorn MOS, including all 'star' commands on all models, 65C12 opcodes (including Rockwell additions), all new Osbyte, Osword and other system calls, sideways

and shadow RAM programming, ROM service calls and header codes, never before published complete Tube documentation and full Master series filing system calls. There is also a complete list of differences between the various Acorn machines.

The book contains example programs such as a disc ID reader, an on-screen clock ROM, a shadow screen data buffer, and many others. An additional programs disc contains all the programs from the book, plus a full-feature memory editor and complete utility ROM!

Please send me:

- copies of *Mastering Operating System: A Dabhand Guide* at £12.95.
- copies of book and 5.25-inch disc at £16.95 (£1.00 discount)
- copies of book and 3.5-inch disc at £17.95 (£2.00 discount)

NAME _____

ADDRESS _____

POSTCODE _____

I enclose a Sterling cheque/PO payable to DABS PRESS for £_____ (Outside UK add £2 p&p.
Charge my Access A/c No _____ Expiry Date _____ Free p&p in UK)

SIGNED _____ DATE _____

Send this coupon with your remittance to **MOS OFFER** Acorn User Merchandising, 141-143 Drury Lane, London WC2B 5TF.

BETTER BY DESIGN

Learning how to tackle programming difficulties before you even touch the keyboard can save time and improve your programs

Peter Eggleton

Designing a computer program can be quite daunting to a newcomer to programming, as not only do you have to solve the computing problem, but also you have to cope with the instructions or language used by the computer. There has been lots of advice on how to write programs in Basic, but little advice has been proffered on how to attack the computing problem. How do you go about writing a big program?

Most home computer users will at some time decide they need a program to solve a particular problem. It's tempting to do this by sitting down at the keyboard with the manual handy and immediately starting to type, inventing your masterpiece as you go. The trouble is all too often the program doesn't work. You can end up with an over complicated program with bits added to compensate for deficiencies in the initial design. There has to be a better way of designing a solution.

There is a limit to the amount of information that the human mind can deal with at one time. Any programmer attempting to understand a complicated program listing gets confused sorting through a mass of detail. This is much worse if that program listing is spread over several pages. Solving any day-to-day problem is often done by breaking it down into successively smaller portions, until the result is a list of easily managed actions. You can do this with programs too. Program design can be broken down into the following areas; analysis, solution, implementation, testing and documentation.

Analysis is the most critical part of the design process; if it is done correctly then succeeding stages will be that much easier. This is an area where applying the principle

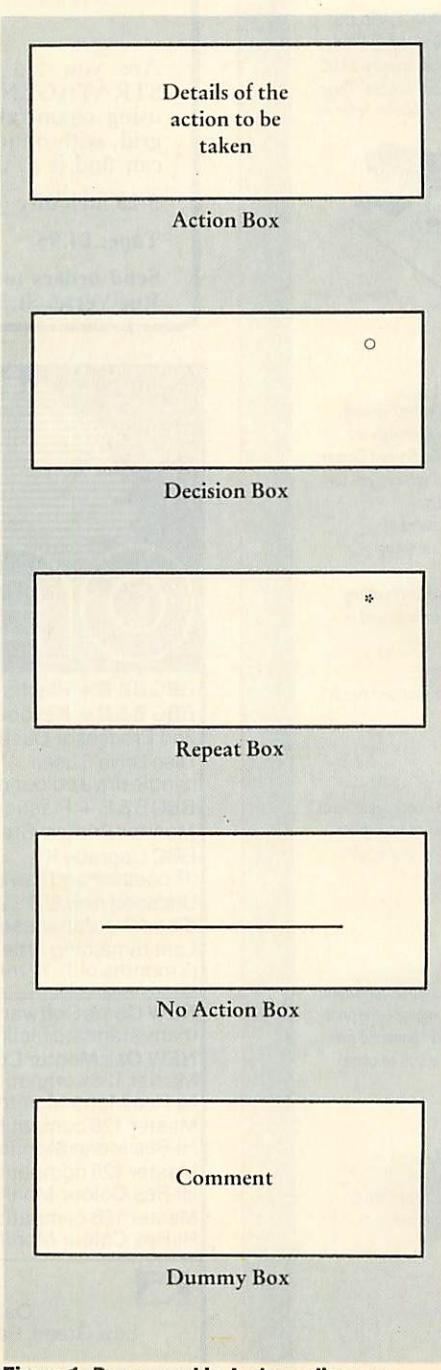


Figure 1. Boxes used in Jackson diagrams

of breaking down a problem into smaller units results in efficient design.

There are a number of methods for doing this. My particular favourite is the use of a technique developed by Michael Jackson which we shall examine later. Use of this system results in both good documentation and a structured design. This means that if the final program is written in BBC Basic, maximum use will be made of the structuring facilities such as REPEAT...UNTIL and procedures. One of the benefits of structured programming is the ease of adding new bits to your program at a later stage, and it also makes your program that much easier to debug.

Documentation is as important to the occasional programmer as it is to the professional. Very few people are able to pick up a program they wrote six months ago and remember its structure and peculiarities. So note everything down as the problem is solved. A further benefit arises because other programs can incorporate parts of an established program quite simply if all the details of how to use a particular procedure are written down.

The actions necessary to solve a problem can be broken down into three groups: sequence, looping and decisions.

A program consists of a series of actions carried out one after another, and the sequence of the actions is obviously important. But there are often occasions when a particular action has to be carried out in a number of different places within a program, and so it makes sense only to have one copy of this routine and bring it into action when needed. Small sections of code to be used several times can be written as functions, procedures or subroutines.

Looping is sometimes referred to as iteration, and includes doing a specified

Power Up!



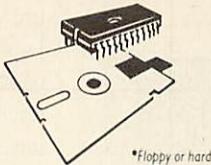
High quality programs for BBC B, B+ and Master which immeasurably increase the practical power of your computer in home, education and laboratory.

Overlay Basic

At last, an effective, totally transparent overlay system for BBC BASIC which is simplicity itself to use. You need never again run out of memory when programming and you can easily incorporate your favourite procedures in programs time and time again. Overlay BASIC offers a series of new BASIC commands enabling you to create a library of subroutines. These subroutines will be automatically called in from disk*, used and 'forgotten' whenever referred to by your program. A program which once occupied 64K RAM may now only need 5K. Run-time facility enables you to distribute programs with overlays on disks which work without a chip.

... one of those neat ideas whose simplicity of use hides a major problem-buster... has opened up a new age for the keen programmer... a touch of genius...

ViewFax Tubelink



ROM + disk + documentation £29.95 inc. VAT and postage

SoftOscilloscope

A powerful emulation of the storage oscilloscope enabling fast real-time collection and analysis of data from many sources. You can input data at up to 100 Hz through the games paddle port. SoftOscilloscope is also configured to run with Unilab, Griffin and George, Philip Harris, Oasis and 3D A/D converters. If you purchase the Professional version, you can configure it to run with other converters. With more sophisticated converters, SoftOscilloscope can process data at up to 50,000 Hz. To exploit all the features of SoftOscilloscope, a printed circuit board is provided free to each purchaser, enabling construction of a sophisticated A/D converter at negligible cost. SoftOscilloscope is fully menu-driven and has features comparable to instruments costing many hundreds of pounds. It can be used for professional data processing encountered in biological research (nerve potentials, etc.), engineering, etc.

Education version: ROM + disk + manual £49.95 inc. VAT & postage

Professional version: extra features plus open access for customising to your own needs:

2 ROMs + 2 manuals + 3 disks £199 inc. VAT & postage.

SoftServo

Control up to eight electro-mechanical servo motors with this easy-to-use package—needs no hardware interface. Servos are cheap and freely available so now you can complete the cybernetic feedback loop. Control equipment, create robots or just switch on the lights when it gets dark. Manual and demo disk incorporate lots of practical ideas.

ROM + disk + manual £49.95 inc. VAT & postage

SoftChart

Use your Epson-compatible printer to produce multi-channel continuous graphical output from your computer. Gives better resolution and speed than screen-dumping—the print head follows your signal and does not sweep from side to side. Use *CHART command from BASIC programs to plot data or use the SoftChart Recorder program supplied, to emulate a four-channel chart recorder. Tick marks and labelling possible.

ROM + disk + manual £49.95 inc. VAT & postage

Payment from individuals must accompany order, and may be made by:

1. Cheque: made out to 'Elsevier' in pounds sterling.
2. Credit card: we accept AmEx, Visa and Access. Please give card number, expiry date, issuing bank (if appropriate), the cardholder's name and address and signature.

Institutional purchase orders acceptable.

Elsevier - BIOSOFT

68 Hills Road, Cambridge, CB2 1LA, UK
Telephone: 0223-68622 Telex 81623

The System utility from KM Software Ltd

Extra commands for BBC B & Master users, Master features include CMOS editor, CHARSET to move the character set into private ram, PVIEW private ram editor.

For the BBC B user it implements the MASTER rom handlers (INSERT/UNPLUG etc), disabled roms stay off even over a CTRL+BREAK.

Plus commands which can be used by both BBC B & MASTER, GPACK (powerful screen packer), Very powerful disassembler (6502, 65C12, I/O, tube, labels etc.), memory editors, Down loader creator, Bad Program recover, Mode designer, Tube editors, Formatter, Verifier etc.

Price £25.00

Also available KM'S Sound to Light converter, This chip contains 10 different screens with an amazing 63 colours and responds instantly to sound input to the cassette port. Just play your favourite music and watch the colours and patterns flow.

Price £12.50

Are you fed up with Zapping aliens why not try STRATAGEN a strategy game for two to four players using colourful graphics as pieces on a large 10 by 8 grid, with options to pass, abort and even cheat (if you can find it...)

5.25 inch disc (40/80 track format): £7.95

Tape: £4.95

Send orders to: KM Software Ltd., 39 Clos des Ormes, Rue Verte, St. Lawrence, Jersey C.I.

OAK COMPUTERS ODDMENTS SALE.

BBC B & B + Plastic Keyboard Strip	£1.00 p&p £0.50
BBC B & B + Keyboard Connector Cable	£1.00 p&p £0.50
2nd Processor Cases	£7.50 p&p £1.50
Disc Drive Cases (single drive colour matching Beeb)	£6.00 p&p £1.50
BBC B & B + Plastic Cases	£10.00 p&p £2.50
Monitor/Printer Stand	£7.50 p&p £3.00
BBC Upgrade Kit (Processor and Keyboard Housing)	£39.00 p&p £4.50
Uncased new 80T 1/2 height double sided disc drive. Japanese manufacture	£75.00 p&p £5.00
Last remaining little used Master 128 (3 months old). 12 month guarantee	£345.00 p&p £5.50

NEW Coms Software (Rom) Easy to use—many standard facilities	£17.95 p&p £1.50
NEW Oak Mentor Computer System	
Master 128 compatible, single 80T disc drive, Hi-Res Mono Monitor	£573.85 p&p £14.00
Master 128 compatible, dual 80T disc drive, Hi-Res Mono Monitor	£665.85 p&p £14.00
Master 128 compatible, single 80T disc drive, Hi-Res Colour Monitor	£803.85 p&p £14.00
Master 128 compatible, dual 80T disc drive, Hi-Res Colour Monitor	£901.60 p&p £14.00



PRICES INCLUDE V.A.T.
Oak Computers, Cross Park House,
Low Green, Rawdon, Leeds, LS19 6HA. Tel: (0532) 502615.



action for a predetermined number of times using a FOR...NEXT loop or REPEAT...UNTIL or WHILE.

Decisions refer to those occasions when a selection of options is available, or perhaps when only one is offered. The Basic commands IF, ON and CASE fall into this category. CASE is only available with Basic 5 on the Archimedes.

Solution

The number one rule when designing a program is to stay away from the keyboard until the program has been completely written. As many of the difficulties as possible should be sorted out on paper, before typing anything in.

The result of the analysis stage should be some form of documentation. This could be in the form of a structure diagram, and if so the solution so far is language independent. That is, it doesn't matter at this stage what computer or language will be used to write the program itself. A further benefit is that if your masterpiece is a success and you wish to transfer it to a different machine, you have most of the hard work done already – the design is still applicable.

Now take the design and encode it. Type in a few procedures that do whatever each part of the design calls for. It is a good idea to take each individual procedure and write it separately. Keep them in separate files – so each is in effect a separate program. These can then be given test inputs and the results of the procedure examined to see if they are correct.

Good documentation means the liberal use of comments in the programming. If memory space becomes tight then comments might have to be removed, but it is unwise to do that before it is necessary.

Making up the complete program just means joining together the prewritten functions and procedures, then writing the 'core' of the program to use them in the right order. Remember that with BBC Basic, one program can be added to the end of another using this technique: first find out where in memory the end of the first program is with PRINT ~ TOP-2. This gives an address in hexadecimal – now use that address by typing * LOAD <program> <address>.

As each individual procedure is tested separately first, full system tests should take a shorter time. A professional would compile a list of tests with their expected results, before carrying any of them out.

You should also look for the unexpected – keys pressed when they aren't asked for,

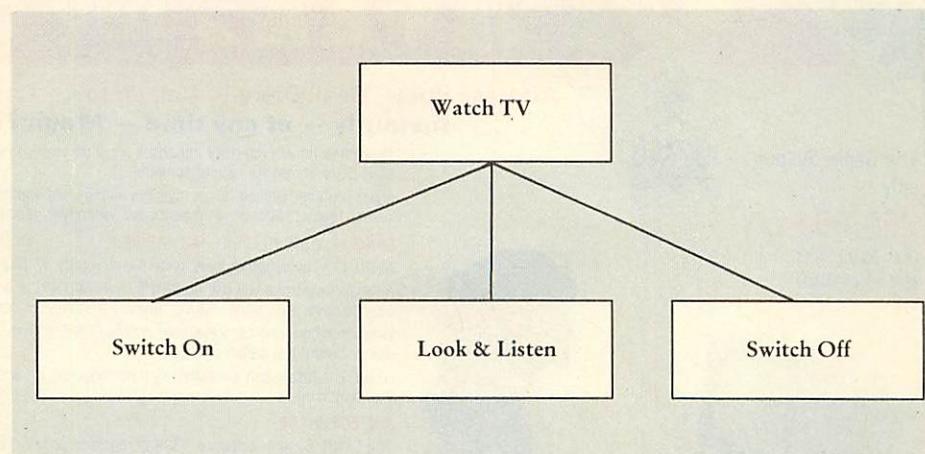


Figure 2. Jackson diagram for watching TV

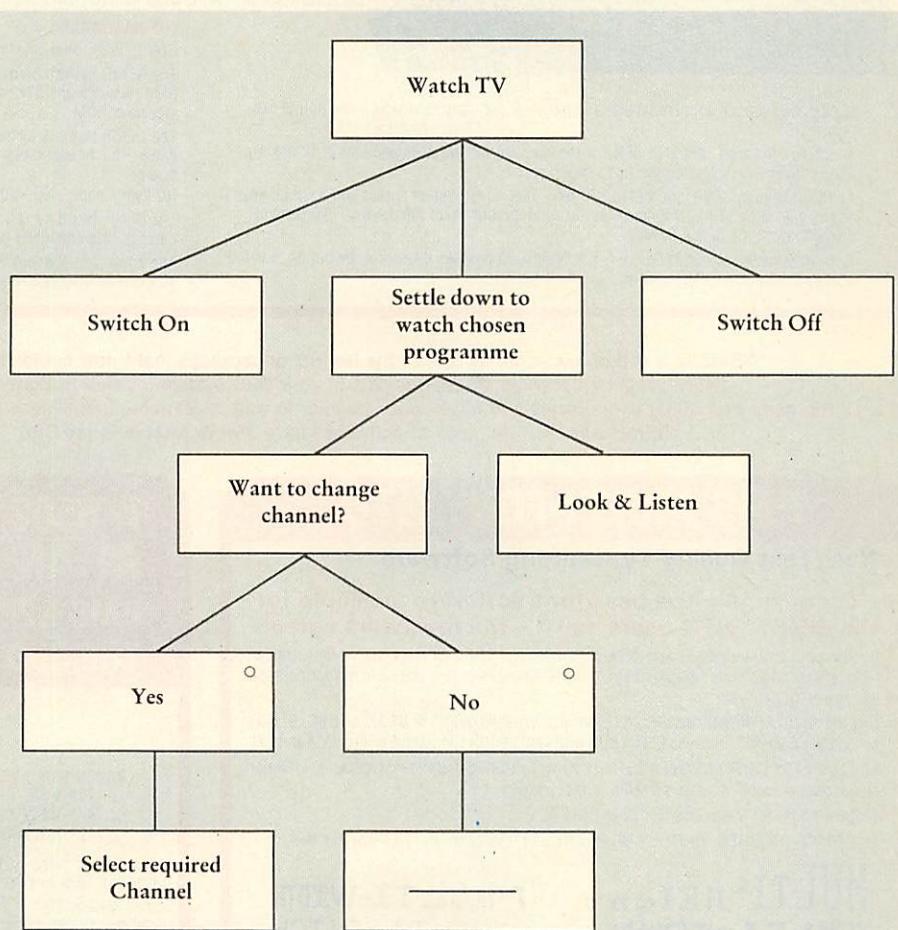


Figure 3. A more elaborate version including channel changing

letters typed in instead of numbers, and so on. Any errors detected and subsequently corrected should then be noted in the original design notes.

There are various means of charting the logical flow through a computer program; perhaps the best known is the flowchart. However, this isn't a method that lends itself to assisting with design – it's better suited to documentation. Another commonly used method is pseudo-code. The principle is that the designer writes down in

short English statements the steps to be taken. This system does lead to a structured design, but it is not a visual system. One technique that is both visual and aids design is the Jackson method.

This offers the advantage that the design of the program is legible and so is easier to understand. Also the code is easier to write because the design irons out the difficult areas, and the solution documents itself, which therefore makes modification at a later stage a very much easier process.

NEW!**GENIE****Your wish is my command...****The Genie System only****£69.00 + VAT** (£79.35 inc. VAT
 plus £1 carriage)**Address Book - Desk Diary - Calculator - Calendar - Phone Book - Notepad.****Instantly - at any time - Magic??? No, just call GENIE!**

How often do you interrupt important work on your computer to use a calculator, look up your address book, consult your diary or make a note of something?

Have you ever wished for an invisible helper, just waiting there in the shadows, behind whatever program you are using, ready to appear, as if by magic, whenever needed?

GENIE - YOUR HELPER, HAS ARRIVED!

GENIE is a revolutionary new system which puts all your day-to-day information literally at your fingertips. A single keystroke will call up GENIE, from WITHIN a wordprocessor, spreadsheet or other application software - no need to save your work - GENIE appears instantly on screen.

When finished, another keystroke makes GENIE vanish, immediately dropping you back to EXACTLY what you were doing, before you called GENIE.

GENIE is a totally self-contained system requiring no access to disk, it is present in your computer from the moment you switch on.

THE SOFTWARE

The GENIE System software - 32K of machine code - has an original screen display, using high resolution windows with up to 7 colours on screen, AND 80 column text display. The screen colours are user selectable to give optimum clarity on any monitor.

GENIE provides: a 10 digit calculator with memory, a 100 year calendar, address book, desk diary, notepad and phone book. Information can be accessed by browsing, or by fast search techniques. The notepad is a mini-wordprocessor with word-wrap, and full cursor editing.

THE HARDWARE

GENIE 'lives' on a small circuit board only 3 inches square.

The GENIE System hardware uses a totally new memory paging technique, developed by PMS, which maps 32K of ROM and 64K of RAM into the address space of a single 16K sideways ROM.

The GENIE board is connected to the computer via a single header on 6 inches of ribbon cable. This header plugs into any ROM socket on the main BBC, MASTER or COMPACT board.

NO flying leads - NO soldering - NO modifications.

The GENIE board can be positioned almost anywhere inside the machine. The ribbon cable is long enough to prevent physical conflicts with other hardware.

The power requirement of GENIE is very low, only slightly more than standard EPROMS, so there are no overheating problems.

"GENIE is a superb package. Its one of the few utility packages that I now couldn't be without" (Acorn User, Aug 87)**"GENIE rapidly becomes an integral part of your BBC system ... well designed" (Pop Comp Weekly, Jun 87)****"... GENIE does everything very quickly and never asks the user to wait ... extreme friendliness of design ... eminently practical" (A+B, June 87)****"GENIE was the one piece of software I have always wanted in my BBC" (Your Computer, July 87)****PMS MULTI-FONT NTQ****Near Text Quality Typesetting Software****"Quite simply the best font software available for the BBC" - NTQ users say it - the reviewers agree -**

If you want to produce quality worksheets, newsletters, OHP slides, menus, leaflets, concert programmes and tickets, exam papers, reports, invoices or just add style to your personal letters - NTQ's for you.

Use NTQ with VIEW, WORDWISE, INTERWORD, WORDPOWER* or BASIC on BBC, B, B+, MASTER, COMPACT and even ELECTRON with ANY EPSON compatible printer (MX and FX). FONT LIBRARY CONTAINS OVER 35 HIGH QUALITY FONTS - standard typefaces + foreign languages + maths/science symbols + fancy styles.

Write or phone for leaflet and full list of fonts.

MIX FONTS, HEIGHTS, WIDTHS AND PITCHES IN ONE LINE OF TEXT - just like this:

**MULTI-HEIGHT
MULTI-FONT****BACKGROUNDS****ÀÓÀÆÇÉâòôûõîé****MULTI-WIDTH
MULTI-PITCH****INVERSE****α±÷×√÷≡≠~≈♪♪****Other features:**

MICRO-JUSTIFICATION - right and left justified proportionally spaced text.

DRAFT mode - for a fast, rough copy for proof reading, but showing ALL NTQ features.

The basic NTQ system consists of a 2 ROM set - one ROM containing the NTQ driver software, and 3 fonts, the other containing a further 4 fonts. Any number of FONT EXTENSION ROMs can be added to the system, each one containing any 4 fonts of the user's choice selected from the FONT LIBRARY. Users can create their own fonts using the FONT DEFINER program supplied on the utilities disk. These fonts can be loaded into sideways RAM or burnt into ROM.

NTQ costs ONLY £34 (including VAT) plus £1 post and packing.

Please state disk size (5.25"/3.5") and printer type when ordering. For details of our Educational Site Licensing and Bulk Purchase agreements phone our Sales Office.

"Despite its power NTQ is a very easy package to use" (Educational Computing).**"The quality of text is quite outstanding" (TUBELINK).**

*Also available: Power Font NTQ - a special version of NTQ for Ian Copestake's WORDPOWER word processor. This combines on-screen foreign/math symbols with NTQ printout - a MUST for serious writers. (Phone 04867 4755 for info.).

A 6502 SECOND PROCESSOR AT AN AFFORDABLE PRICE!**PMS B2P-6502****THE SUB-£100 SECOND PROCESSOR****BANISH "Bad Mode" MESSAGES**

- ★ 30K BASIC - all MODES
- ★ 44K in HiBASIC - from PMS

WIDEN WORD PROCESSING STORAGE

- ★ 30K VIEW 2-80 column display
- ★ 47K VIEW 3 and HiVIEW
- ★ 42K HiWORDWISE PLUS - from PMS

SWELL SPREAD SHEET SIZES

- ★ 30K VIEWSHEET - MODE 0
- ★ 44K ULTRACALC 2
- ★ 42K HiINTERSHEET

The B2P is fitted with a CMOS65C02 processor and works with both SINGLE and DOUBLE density DFS's. The "BOS" ROM, supplied with the B2P, contains the B2P Operating System + TUBE Toolkit - 65C02 disassembler, B2P memory editor, memory shifters, printer buffer.

The B2P runs software obeying the ACORN TUBE protocols, this includes BASIC, the whole VIEW family, PASCAL, COMAL, LISP, BITSTIK etc.

The B2P is only 5.5" x 4" - external to the BBC - can be fitted internally if desired.

"I have no hesitation in giving it a firm thumbs up - high power at low cost" (Acorn User (March 87))

YOU CAN ADD SECOND PROCESSOR POWER FOR ONLY

£99.95 (including VAT) + £2 carriage.HiBASIC (disk or ROM) **£5.** HiWORDWISE PLUS **£6.**ALSO AVAILABLE the E2P-6502 - ELECTRON version of the 6502 Second Processor - only **£89** including VAT (Overseas orders no VAT required).**Permanent Memory Systems**38 MOUNT CAMERON DRIVE
EAST KILBRIDE G74 2ES
SCOTLAND**03552-32796** (24 Hour)

The basic assumption of Jackson's system is that there are just four types of action within a program: loops, decisions, procedures and assignments. The system uses rectangular boxes to represent each action; unlike flow charts, there is no need for different shaped boxes. The program flows from left to right, top to bottom of the diagram. A '*' in the top right hand corner of a box is used to indicate looping at levels below, whilst an 'o' in the same place is used to show a selection. A selection consists of one of a choice of alternative routes. The box which has just a straight line in it is used with a selection construction. This is necessary to show that nothing happens if the condition required in its associated box is not satisfied, as with the IF...THEN statement. The types of rectangles used in Jackson diagrams are shown in figure 1. If the few simple rules below are also applied, they make the diagram even easier to follow, but they are not mandatory. The rules are:

- Actions should not be detailed in repeat or decision boxes
- There should only be one path from an action box to the top of the structure
- Only one part of a selection can apply
- The output from a box must be either all selection boxes, just one repeat box or all action boxes
- A further box known as a dummy box, which usually contains just a comment describing the lower levels, is used to satisfy the rules concerning output

Let's look at a few simple exercises to see how the system works. The pastime of watching a TV program could be split down into three action boxes, as shown in figure 2 on page 105.

Looking more closely, each of the three lower boxes involves a number of complex actions. For instance, there's no ability to choose which channel to watch. If the diagram is expanded to include this selection, it might look like figure 3. Notice the use of dummy boxes, which are used to obey the rule: output of the box must be either all selection, all action or one repeat box. This trivial example does demonstrate how a problem is gradually broken down. Now let's use the system to produce a bit of BBC Basic.

The object is to design a guessing game – a simple program that takes a number from the keyboard and compares it to a randomly generated one, giving an indication as to whether the number input is higher or lower than the other. The guessing process is repeated until a match is found. A quick

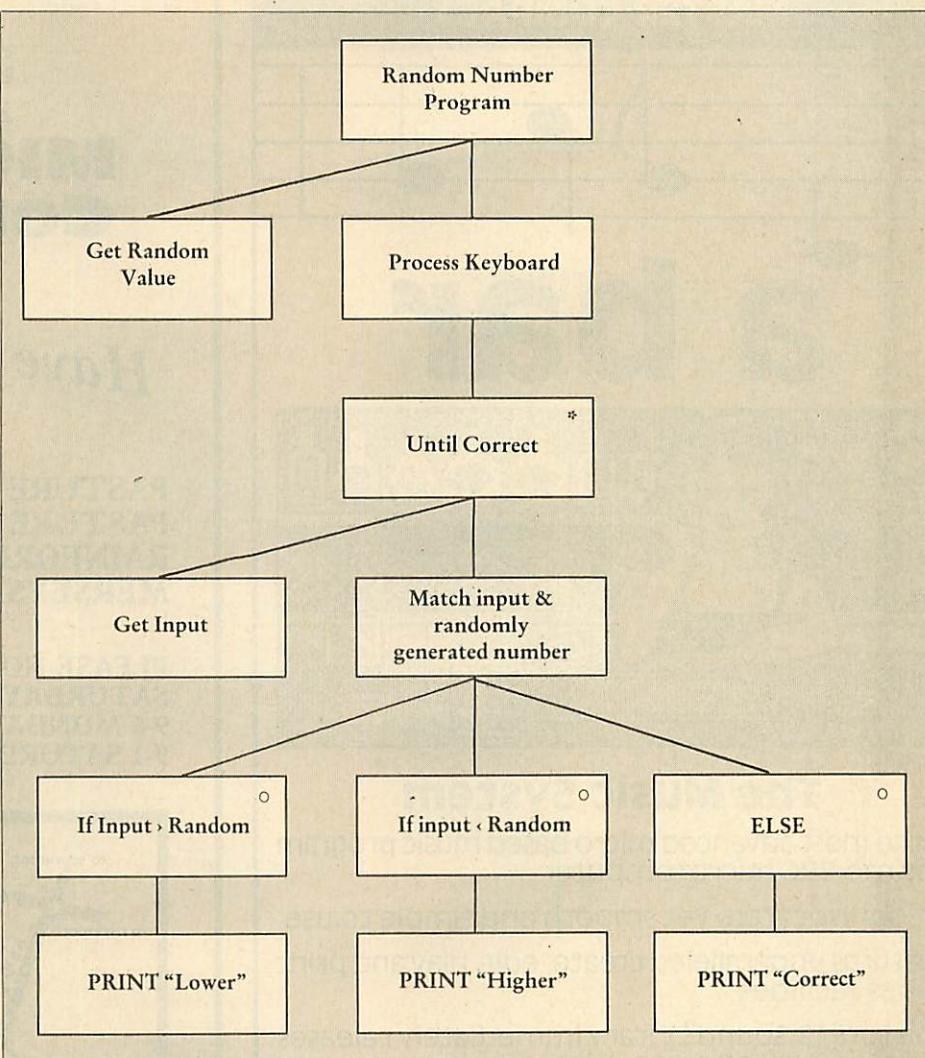


Figure 4. Jackson diagram for the guessing game program

GUESSING GAME PROGRAM

```

10 REM Guess number
20 REM
30 number% = RND(100)
40 REPEAT
50 INPUT "Enter your guess"; guess%
60 IF guess% > number% THEN PRINT "Lower"
ELSE IF guess% < number% THEN PRINT "Higher"
ELSE PRINT "Correct"
70 UNTIL guess% = number%
80 END
  
```

look at this program will show that some iteration (or looping to the rest of us) and decisions will be necessary, so all the different types of boxes will be used in the design. Before looking at figure 4 try to work out the diagram for yourself. Remember to use dummy boxes where necessary to follow the guidelines above.

Using the Jackson diagram, each of the boxes can be translated into a suitable Basic statement. The completed program is

shown in the box. Notice that the REPEAT loop controls all the statements that correspond to boxes lower down.

Note that although this program has a direct one-to-one relationship with the Jackson diagram, in simple cases this is not always necessary. More than one related action could be entered in the one box. However, it's best to adopt the one statement per box approach from the start.

Alert readers will have noticed that it is impossible to use the GOTO statement when developing programs using Jackson diagrams. But structured programming doesn't just mean not using GOTOS. It means using the structure that the Jackson diagram design gives you, and making your programs as readable as possible, with clear statements, lots of space and comments, and variable names that tell you what each variable does.

The logical design required to produce Jackson diagrams results in a program that is easier to follow, and subsequently should be easier to change. Next time you have a program to write – try it.

NOW ALSO AVAILABLE FOR THE
MASTER COMPACT



The Music System

is the most advanced micro based music program for the BBC microcomputer

is sophisticated, yet smooth and simple to use features unparalleled create, edit, play and print tunes facilities

the Song & Sound Library immediately releases the flavour of both vintage and nouveau compositions

the acclaimed Instruction Manual uncorks all the secrets to its successful and easy use

LET THE MUSIC FLOW, LIMITED ONLY BY YOUR OWN TASTES AND IMAGINATION

BUY THE MUSIC SYSTEM TODAY!

DISC PACK: EDITOR • SYNTHESISER • KEYBOARD • LINKER • PRINTOUT • SONG AND SOUND LIBRARY • £29.95 INC VAT. PLEASE ADD £1.25 P&P PER ORDER.

CASSETTE 1: KEYBOARD • SYNTHESISER • SOUND LIBRARY • £9.95 INC VAT.

CASSETTE 2: EDITOR • PRINTOUT • SONG AND SOUND LIBRARY • £9.95 INC VAT. PLEASE ADD £1.25 P&P PER ORDER.

ADDITIONAL SONG LIBRARY DISC: 2 TOCCATA AND CAROLS • 3 400 YEARS OF MUSIC • 4 MAINLY BACH • 5 IAN WAUGH ORIGINALS • 6 OLD FAVOURITES • £4 EACH INC VAT, POSTAGE FREE.

NEW UTILITIES DISC: • KEYBOARD • MUSIC FILE CONVERTER • PLAY FROM BASIC UTILITY TMS MUSIC FILE CONVERTER • £6 INC VAT POSTAGE FREE • NOW WORKS ON BBC MASTER, B+ AND ALL DFS AND DDFS (INC. SOLIDISC AND WATFORD).

ECNET VERSION £89.70 INC VAT. PLEASE ADD £1.25 P&P, AMSTRAD AND COMMODORE 64 VERSIONS ALSO AVAILABLE.

ORDERS TO SYSTEM DEPT. A, 12 COLLEGIATE CRESCENT, SHEFFIELD S10 2BA (0742) 682321.

DEALER ENQUIRIES WELCOME



i ISLAND • LOGIC
SYSTEM SOFTWARE SYSTEM

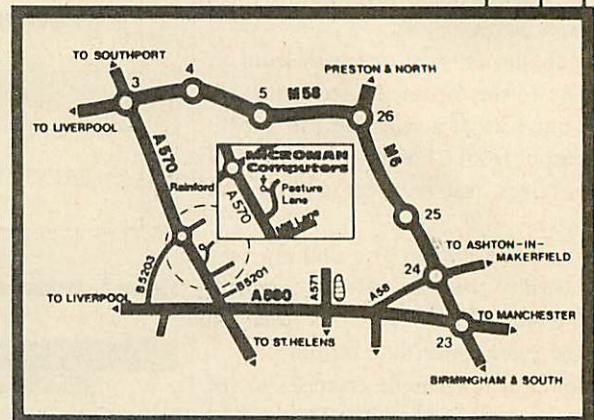


MICROMAN
Computers

Have Moved To

PASTURE LANE FARM,
PASTURE LANE,
RAINFORD, ST. HELENS,
MERSEYSIDE, WA11 8PU

PLEASE NOTE NEW
SATURDAY OPENING TIMES
9-6 MONDAY TO FRIDAY
9-1 SATURDAY



Our new premises provides an unusual setting for a computer showroom set in the green belt area of Rainford and converted from an old stone barn. The property is close to the main motorway links and provides ample car parking. The premises has two showrooms allowing us to display a larger range of products plus greater facilities for the demonstration of Acorn computers, peripherals and software.

This is particularly relevant with the launch of the new range ARCHIMEDES COMPUTERS from Acorn, with which we enter a new era of low cost RISC computing and as an Acorn Dealer Microman will be supporting the new technology to the full providing systems for the enthusiast, education, business and industry.

We would like to extend a welcome to customers old and new to call in and see us at our new premises.

**OUR PHONE NUMBER
WILL REMAIN**
074488 3667

MICROMAN Computers

PASTURE LANE FARM,
PASTURE LANE, RAINFORD,
ST. HELENS, MERSEYSIDE, WA11 8PU

PHONE 074488 3667

SHOWROOM

SHOWROOM OPENING
9-6 MONDAY TO FRIDAY
9-1 SATURDAY

MAIL ORDER

PHONE 074488 5242

We accept both Access and Visa credit cards. Simply telephone your order, giving card number, expiry date, name and address, or send your order with cheque or postal order to the address opposite.

DELIVERY CHARGES
INCLUDING VAT

Computers/Printers/Drives:
Next day £8.00, Trackback £4.00
Small Items: £1.00

VISA

ACORN DEALER : ECONET : SERVICE CENTRE

Archimedes

• ARCHIMEDES 300 SERIES:

	Ex VAT	Inc VAT
Archimedes 305 Base	799.00	918.85
Archimedes 305 Monochrome	849.00	976.35
Archimedes 305 Colour	999.00	1148.85
Archimedes 310 Base	875.00	1006.25
Archimedes 310 Monochrome	925.00	1063.75
Archimedes 310 Colour	1075.00	1236.25

Phone for prices and details of Archimedes 400 Series.

• BBC MASTER SERIES:

	Master 128	379.00	435.85
Master Turbo Module		108.70	125.00

MASTER 512 UPGRADE SPECIAL OFFER

£199.00

Price includes VAT.

This offer includes: FREE MICROMAN 512 DISC UTILITIES SOFTWARE WORTH £12.95.

• MASTER 512 SOFTWARE:

	Microman 512 Disc Utilities	11.26	12.95
Words & Figures		99.00	113.85
Ability (Integrated Package)		99.00	113.85
VP Info		86.09	99.00
Volkswriter		39.09	44.95

• BBC MASTER COMPACT SERIES:

	Master Compact	349.00	401.35
Master Compact + TV Modulator		363.00	417.45
Master Compact + Green Monitor		399.00	458.85
Master Compact + Colour Monitor		549.00	631.35
RS232 Kit		26.00	29.90
Additional Floppy Disc Drive		99.00	113.85
Pal TV Adaptor		26.00	29.90

• ECONET NETWORKS:

	Master Econet Terminal	329.00	378.35
Achimedes/Master Econet Module		43.47	49.99
Filestore E01		828.00	952.20

	Filestore E20	721.00	829.15

OPUS DISC DRIVES

Opus 5802 400K 40/80T

£109.95

Opus 5802DB 800K 40/80T

£209.95

Opus 5802D 800K 40/80T

+ Power Supply

£239.95

Prices include VAT.

• BBC MONITORS:

	Microvitec 1431 Std/Metal	199.13	229.00
Microvitec 1451 Med/Metal		240.00	276.00
Philips CM8833 Med/RGB/CV		250.00	287.50
Philips TV Tuner (Composite Video)		69.52	79.95
Philips Green 7502		73.91	85.00
Philips Amber 7522		77.39	89.00
Philips White 7542		77.39	89.00

• BBC DISC INTERFACES/UPGRADES:

	Acorn 1770 Disc Interface	43.44	49.95
Acorn ADFS ROM		26.08	29.99
Watford 8271 Disc Interface		60.00	69.00

• BBC B CO-PROCESSOR ADAPTERS:

	Acorn Co-Pro Adapter	75.00	86.25
Watford Co-Pro Adapter		50.00	57.50

• BBC B ROM BOARDS:

	Ex VAT	Inc VAT
Watford Solderless ROM Board	32.00	36.80
Watford Battery Backup	3.00	3.45
Aries B12 Sideways ROM Board	40.00	46.00
Aries B12c Adapter	5.00	5.75
ATPL Sideways ROM Board	38.00	43.70

• BBC B SIDEWAYS RAM RAM:

	Ex VAT	Inc VAT
Watford 16K Sideways RAM Module	29.00	33.35
Watford ROM/RAM Card + 32K DRAM	39.00	44.85
Watford ROM/RAM Card 64K DRAM	52.00	59.80
Watford ROM/RAM Card + 128K DRAM	80.00	92.00
Watford Sideways ZIF Socket	15.00	17.25

• BBC B SHADOW BOARDS:

	Ex VAT	Inc VAT
Watford 32K Shadow RAM Board	59.00	67.85
Aries B32 RAM Extension Board	80.00	92.00

• BBC EPROM PROGRAMMERS/ERASERS:

	Ex VAT	Inc VAT
Control Telemetry EPROM Prog	95.00	109.25
Uviprom EPROM Prog	18.22	20.95
Uviprom EPROM Prog + ZIF	22.57	25.95
Multiprom Programmer	39.09	44.95

Uviprom & Multiprom programmers require either SWR or ROM software listed below.

	Ex VAT	Inc VAT
Uviprom ROM Software	4.35	5.00
Uviprom SWR Disc Software	1.74	2.00
Watford EPROM Eraser GT	30.00	34.50
Uvipac EPROM Eraser	18.22	20.95
Uvipac EPROM Eraser + Timer	22.57	25.95

• EPROMS/RAM CHIPS:

	Ex VAT	Inc VAT
Epmos 2764 8K	3.00	3.45
Epmos 27128 16K	3.00	3.45
Epmos 27256 (12.5v)	5.00	5.75
Epmos 27512	9.00	10.35
RAM 6264LP-15 8K	3.00	3.45

• BBC MODEMS:

	Ex VAT	Inc VAT
Pace Linnet + Commstar II	139.00	159.85
Pace Nightingale + Commstar II	86.09	99.00
Watford Apollo Modem	75.00	86.25

• BBC SPECIAL KEYBOARDS:

	Ex VAT	Inc VAT
Concept Keyboard A4	109.50	125.93
Concept Keyboard A3	139.50	160.43

• BBC DIGITISERS:

	Ex VAT	Inc VAT
Graphpad II (BBC)	65.65	75.50
Watford BEEB Video Digitiser	109.00	125.35
Watford Magazine Maker	129.00	148.35

• BBC MOUSE/TRACKERBALL PRODUCTS:

	Ex VAT	Inc VAT
Watford Quest Mouse	35.00	40.25
Watford Quest Mouse + Paint	59.00	67.85
AMX Mouse + Super Art	69.52	79.95
AMX Mouse Mat	5.00	5.75
AMX Pagemaker	43.44	49.95
AMX Extra Extra (Pagemaker)	21.70	24.95
AMX Super Art ROM: BBC B	43.44	49.95
AMX Super Art: Master	43.44	49.95
AMX MAX	17.35	19.95
Fleet Street Editor	34.74	39.95
Fleet Street Editor Fonts/Graphics	13.00	14.95
Fleet Street Editor Admin Xtra	13.00	14.95
Fleet Street Editor Disney	13.00	14.95
Trackerball RB2 + ICON Soft	59.00	67.85
Trackerball + Pointer (Master)	59.00	67.85

• BBC/MASTER CONSOLE UNITS:

	Ex VAT	Inc VAT
Viglen Console	43.44	49.95
Viglen Master Console	52.13	59.95

• BBC/CAD SYSTEMS:

	Ex VAT	Inc VAT
Bistrik 2 (Master Compatible)	694.78	799.00
Bistrik 2 Upgrade	400.00	460.00
Pineapple Diagram	25.00	28.75
Pineapple Diagram Utilities	10.00	11.50
Pineapple PCB Designer	85.00	97.75
AMX DESIGN	60.83	69.95

PANASONIC KXP1081

£179.00

Price includes VAT.

	Ex VAT	Inc VAT
Epson LX800	239.00	274.85
NEC Pinwriter P660 (80) Parallel	449.00	516.35

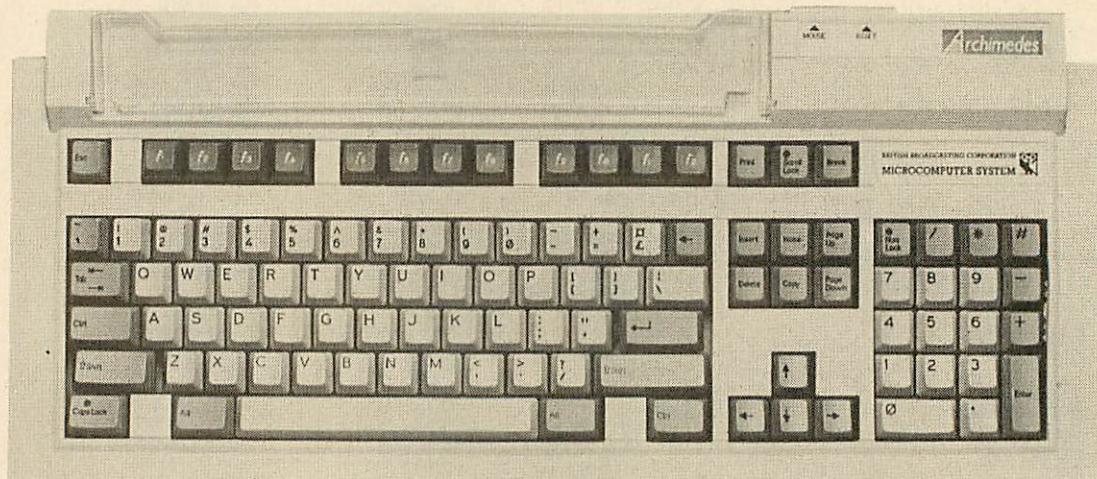
|--|--|

COMPETITION

YOUR OWN ARCHIMEDES

If our reviews of the revolutionary micro have got your mouth watering, then get to work on our competition and win one for yourself

- 1) In the 17th century many mathematicians constructed mechanical digital calculating machines. Who built the first of these, a machine which could add and subtract, in 1542? And which modern computer language is he linked with?
- 2) Which German mathematician built, in 1673, the first mechanical digital device which could also multiply, divide and take square roots? The invention was unsuccessful, and only became commercially available after his death.
- 3) Who designed, but never completed, the first mechanical computing device with all the elements of a modern computer, which had a memory, could do arithmetic and be programmed via a system of punched cards? Also, which modern computer language is his assistant associated with?
- 4) Who developed a series of punched-card tabulating machines to ease the job of the US Bureau of Census in 1890? What company eventually absorbed the punched-card business? Which computer language widely used in scientific work is his name associated with?
- 5) In 1959, a servicewoman in the US Navy developed a computer language still widely used in the business and banking world. Who was she, and what is the language?



Here's your chance to win one of Acorn's exciting Archimedes range - the 32-bit BBC micros that bring the power of a mini-computer into your classroom or living room. Last month Bruce Smith and Graham Bell reviewed the Archimedes for *Acorn User*. Their conclusion: 'A micro that is potentially a world beater. Acorn has put itself at the top of the tree again.'

We have an A305 Archimedes to give to the lucky winner. It has half a megabyte of RAM, the Arthur operating system, an

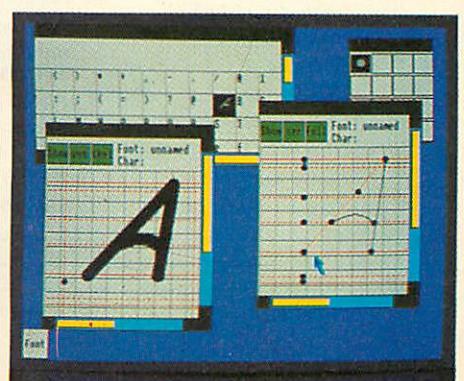
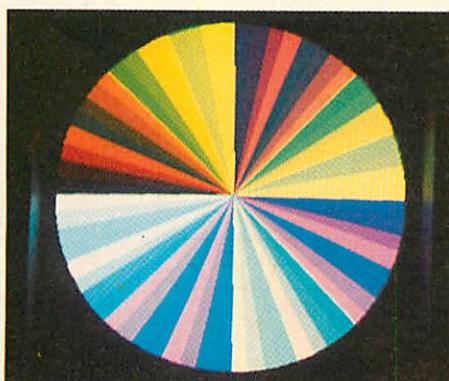
800k 3.5-inch disc drive and a colour monitor, plus the ability to run your Basic programs 20 times faster than a BBC model B.

Computer buff or raw beginner - it's a competition anyone can enter. We've set five questions about the history of computing; all you need to do to enter is supply the answers. Take care; they aren't quite as straightforward as you might think.

Put your answers on a postcard, and send them to *Acorn User* Archimedes

Competition, Redwood Publishing, 141-143 Drury Lane, London WC2B 5TF, to arrive by November 12. Don't forget to include the coupon below with your entry - entries can't be accepted without it. The winner will be the first correct set of answers pulled out of the hat, and the editor's decision is final.

ACORN USER
COMPETITION
OCTOBER



WHY

buy time switches,
a burglar alarm,
and enough wiring
to make it all happen?



WHEN



Red Boxes provide a
home automation and
security system that...

WORKS OFF YOUR MICRO

Announces an intruder

Starts the washing machine

NEEDS NO SPECIAL WIRING

Discourages the would-be burglar

Tells you when the baby's crying

IS SIMPLE TO INSTALL AND USE

Switches on the electric blanket

Wakes you for Breakfast Time

DOESN'T TIE UP YOUR COMPUTER

Turns on the dishwasher

Controls your heating

IS EASY TO PROGRAM

Turns on the light when you walk in

Puts the kettle on

GIVES YOU A NETWORKING FACILITY

Switches on Crossroads

Switches off Crossroads

AND COSTS JUST £129

With Red Boxes home automation becomes a reality at last. Programmed simply and easily via your micro*, Red Boxes use the mains wiring of your home to send signals which will control any appliance powered by a standard 13amp socket. That gives you control over your home environment - without wires trailing all over the place.

Home automation with Red Boxes also provides a sophisticated security system. At one level, it is an efficient burglar alarm which can detect and announce an intruder. At another level, you can make your house appear full of life when nobody's at home,

simply by programming lights, television and radio to operate in your absence.

And if you have two micros, with Red Boxes you've got a local area network as well. It's a system that expands with your needs - and your imagination in home automation applications.

Most remarkable of all, the Red Boxes starter system costs only £129. And additional Red Boxes cost just £34.95. Get yours now, by clipping the coupon. Credit card holders can call 0480 87464.

*The Red Boxes system will work off an Amstrad, BBC Micro, Commodore 64, IBM PC or Spectrum 48k/128k.

To: Electronic Fulfilment Services, Chesterton Mill,
French's Road, Cambridge CB4 3NP.

Please send me further details of the Red Boxes system.

Please send me a Red Box starter system at £133 (including £4 p&p).

My computer is a:

Amstrad
 BBC Micro
 Commodore 64
 IBM PC
 PC Compatible
 Spectrum 48k/128k

Name _____

Address _____

Also include:

...project manuals at £9.95
...additional Red One control boxes at £36.95 each (including £2 p&p).
...additional Red Two infra red sensors at £36.95 each (including £2 p&p).

I enclose my cheque for a total of £..... made payable to General Information Systems Ltd., Readers' Account.

Please charge a total of £..... to my Access/American Express card.

Account number.....

Signature.....

Postcode _____

For credit card orders or further information, call 0480 87464.

YELLOW PAGES

INDEX / COMPATIBILITY

Entering listings

To make the task of entering listings easier, *Acorn User* has adopted several standards in the yellow pages. Programs are listed with line numbers in increments of 10, so type AUTO <Return> for automatic line numbering before you start. Before you list what you've entered, type LISTO 1 <Return> to provide spaces after the line numbers. Programs in the yellow pages are often listed to a width of 40 characters, so type MODE 6 <Return> before you start. Comparing the line-endings of your listing with the yellow pages will help you spot extra or missing characters.

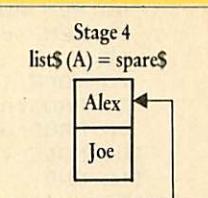
To make sure that the program you want to enter will work on your particular machine, check the index below. All the listings work with Basic 1, 2 and 4 (unless stated otherwise) and with operating systems OS1.2 or above. If a program is accompanied by an article, please read the article first. If special care is needed when entering, we provide an easy-to-complete 'How To Enter' box.

Once you've typed in your program, save it to tape or disc then test it by running it. If you have a major problem with a listing, ask someone to check it. If you still have difficulties, you can also send off for a list of *Checksums* which help you find the errors. Send a large sae (26p stamp) to *AUChecksums*, PO Box 641, London NW9 8TF.

SORT IT OUT YOURSELF

119

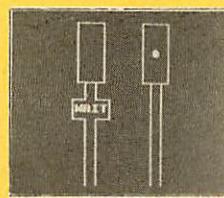
Put long records in order with Joe Telford's range of sorting techniques



GAIN CONTROL

121

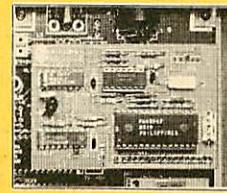
Learn the principles of computer control with Peter Julian's program



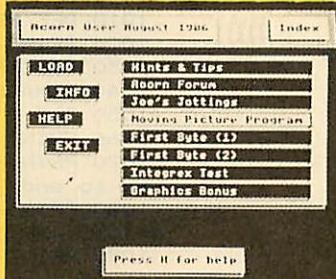
NETWORKS

124

Robin Newman's network menu for Acorn and SJ file servers



DISCS AND TAPES



All the listings on these pages can be found on this month's listings disc or cassette. See page 130 for details of how to order.

BACK ISSUES



For help with entering and debugging listings see the following back issues: April '86, June '85, Aug '84, Sept '83.

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	6502SP/Turbo	ADFS	Econet	Shadow RAM	Monthly T/D	
Hints & Tips	114											
Listing 1		■	■	■	■	■	■	■	■	■	■	
Listing 2		■	■	■	■	■	■	■	■	■	■	
Listing 3		■	■	■	■	■	■	■	■	■	■	
Acorn Forum	116											
Listing 1		■	■	■	■	■	■	■	■	■		
Listing 2		■	■	■	■	■	■	■	■	■		
Listing 3		■	■	■	■	■	■	■	■	■		
Listing 4		■	■	■	■	■	■	■	■	■		
Listing 5		■	■	■	■	■	■	■	■	■		
Joe's Jottings	119											
Listing 1-6		■	■	■	■	■	■	■	■	■		
Control												
Listing 1	121	■	■	■	■	■	■	■	■	■		
Listing 2		■	■	■	■	■	■	■	■	■		
Network Page	124	■	■	■	■	■	■	■	■	■		
Top of the List		■	■	■	■	■	■	■	■	■		
Notes:		(1) Listing 1 needs sideways RAM										

YELLOW PAGES

HINTS & TIPS

See Hints & Tips, page 43

Listing 1. View printer driver generator

```

10 REM Hints & Tips Listing 1
20 REM View Printer Driver Generator
30 REM by Martin Phillips
40 REM For BBC B/B+/M/C/E
50 REM (c) Acorn User October 1987
60 :
70 MODE 1
80 PROCinit
90 PROCrn
100 MODE 7
110 END
120 :
130 DEF PROCinit
140 @%0
150 DIM cli 30
160 *KEY 10 OLDIM MODE 7IM IN LISTIM
170 VDU 19,0,4,0,0,0
180 VDU 19,2,6,0,0,0
190 code%=&900
200 C%=&code%+&100
210 FOR N%0 TO 13
220 $(C%+12*N%)="""
230 NEXT
240 FOR N%0 TO 17
250 tot%0
260 FOR I%0 TO 7
270 READ a$
280 a$="&"a$
290 val%=&EVAL a$
300 code%? (N%*8+I%)=val%
310 tot%+tot%+val%
320 NEXT I%
330 READ a$
340 a$="&"a$
350 IF EVAL a$<>tot% THEN PRINT "Error
at DATA line ";N%+1:END
360 NEXT N%
370 FOR N%=&8A TO &FF
380 code%?N%=&FF:NEXT N%
390 ENDPROC
400 :
410 DEF PROCrn
420 PROCshow
430 VDU 26,28,0,31,39,19
440 COLOUR 131
450 CLS
460 COLOUR 0
470 PRINT " E..Edit L..Load
S..Save"
480 PRINT " £..Pound Q..Quit
P..Print"
490 VDU 28,0,31,39,23
500 COLOUR 130
510 CLS
520 REPEAT
530 CLS
540 COLOUR 0
550 PRINT "Enter command: ";
560 G$=CHR$(GET AND 95)
570 PRINT G$'
580 IF G$="E" THEN PROCedit
590 IF G$="L" THEN PROCload
600 IF G$="S" THEN PROCsav
610 IF G$="@" THEN PROCpound
620 IF G$="Q" THEN PROCquit
630 IF G$="P" THEN PROCprint
640 UNTIL G$="Q"
650 ENDPROC
660 :
670 DEF PROCshow
680 VDU 26,28,0,18,39,0,17,128,12
690 COLOUR 128
700 COLOUR 3

```

Continued ►

► Hints & Tips listing 1 continued.

```

710 PRINT " View Printer Driver Ge
nerator"
720 COLOUR 1
730 PRINT TAB(10) "ON";
740 COLOUR 2
750 PRINT TAB(20) "OFF"
760 COLOUR 3
770 FOR N%0 TO 13
780 PRINT CHR$(64+N%); "/" ;CHR$(80+N%);
790 COLOUR 1
800 PRINT " ";
810 FOR I%1 TO 3
820 A%?code%?(&8A+I%+N%*8)
830 IF A%<255 AND I%1 THEN PRINT ;A%;
840 IF A%<255 AND I%>1 THEN PRINT ",";
A%:
850 NEXT I%
860 COLOUR 2
870 PRINT SPC(17-POS);
880 FOR I%5 TO 7
890 A%?code%?(&8A+I%+N%*8)
900 IF A%<255 AND I%5 THEN PRINT A%;
910 IF A%<255 AND I%>5 THEN PRINT ",";
A%:
920 NEXT I%
930 COLOUR 3
940 PRINT SPC(28-POS);
950 PRINT $(C%+N%*12)
960 NEXT N%
970 VDU 26,28,0,31,39,23
980 COLOUR 130
990 ENDPROC
1000 :
1010 DEF PROCedit
1020 PRINT "Edit which code? ";
1030 C$=CHR$(GET AND 79)
1040 T%=ASC(C$)-64
1050 CLS
1060 PRINT "Editing code "C$
1070 PRINT "Enter a number or press RET
URN to end"
1080 PRINT "Enter start code: ";:PROCco
de(O)
1090 PRINT "Enter end code: ";:PROCcode
(4)
1100 INPUT "Enter comment: "com$
1110 $(C%+12*T%)=LEFT$(com$,11)
1120 PROCshow
1130 ENDPROC
1140 :
1150 DEF PROCload
1160 REPEAT
1170 INPUT "Enter filename: " name$
1180 name$=LEFT$(name$,7)
1190 ch%?OPENUP ("P."+name$)
1200 CLOSE# ch%
1210 IF ch%0 THEN VDU 7:PRINT "No such
driver"
1220 UNTIL ch%<>0
1230 PROCoscli("LOAD P."+name$+" 900")
1240 PROCshow
1250 ENDPROC
1260 :
1270 DEF PROCsav
1280 INPUT "Enter filename: "name$
1290 name$=LEFT$(name$,7)
1300 PROCoscli("SAVE "+name$+" 900 +FF
400")
1310 PROCoscli("SAVE P."+name$+" 900 +1
FF")
1320 ENDPROC
1330 :

```

Continued ►

YELLOW PAGES

HINTS & TIPS

◀ Hints & Tips listing 1 continued

```

1340 DEF PROCpound
1350 INPUT "Enter ASCII code for £: " p
%
1360 code%?&4C=p%
1370 ENDPROC
1380 :
1390 DEF PROCquit
1400 PRINT "Are you sure? ";
1410 g$=CHR$(GET AND 95)
1420 IF g$<>"Y" THEN G$=""
1430 ENDPROC
1440 :
1450 DEF PROCprint
1460 VDU 2
1470 PROCshow
1480 VDU 3
1490 ENDPROC
1500 :
1510 DEF PROCoscli($cli)
1520 X%=cli MOD 256
1530 Y%=cli DIV 256
1540 CALL &FFF7
1550 ENDPROC
1560 :
1570 DEF PROCcode(c)
1580 code%!(&8A+T%*8+c)=&FFFFFF
1590 INPUT LINE n$
1600 I%=c
1610 REPEAT
1620 I%=I%+1
1630 code%?(&8A+T%*8+I%)=VAL(n$)
1640 x=INSTR(n$,"")
1650 n$=MID$(n$,x+1)
1660 UNTIL x=0
1670 code%?(&8A+T%*8+c)=I%-c
1680 IF (I%=c+1) AND (n$=="") THEN code%!
!(&8A+T%*8+c)=&FFFFFF
1690 ENDPROC
1700 :
1710 DATA 4C,1F,04,4C,13,04,4C,19,137
1720 DATA 04,4C,56,04,4C,56,04,00,150
1730 DATA 00,00,00,A9,02,20,EE,FF,2B8
1740 DATA 60,A9,03,20,EE,FF,60,8D,406
1750 DATA 10,04,8E,11,04,8C,12,04,159
1760 DATA AD,0F,04,F0,09,EE,0F,04,2BA
1770 DATA AD,10,04,4C,57,04,AD,10,225
1780 DATA 04,C9,8D,D0,06,CE,0F,04,311
1790 DATA 4C,50,04,C9,00,30,10,C9,272
1800 DATA 60,D0,02,A9,23,20,E3,FF,400
1810 DATA AE,11,04,AC,12,04,60,29,20E
1820 DATA 0F,0A,0A,0A,AA,BD,8A,04,222
1830 DATA C9,FF,F0,EC,49,80,9D,8A,594
1840 DATA 04,29,80,D0,04,E8,E8,E8,439
1850 DATA E8,BD,8A,04,29,03,A8,E8,3EF
1860 DATA A9,01,20,EE,FF,BD,8A,04,402
1870 DATA 20,EE,FF,E8,8B,D0,F1,4C,58A
1880 DATA 50,04,FF,FF,FF,FF,FF,FF,64E

```

◀ Hints & Tips listing 2 continued

```

140 FOR pass=0 TO 3 STEP 3
150 P%=&900
160 [
170 OPT pass
180 LDA #1
190 LDX #block
200 LDY #0
210 JSR osargs
220 :
230 LDY #&FF
240 .spaces
250 INY
260 LDA (block),Y
270 CMP #32
280 BEQ spaces
290 BCC noarg
300 :
310 LDX #0
320 .notspaces
330 STA buffer,X
340 INX
350 INY
360 LDA (block),Y
370 CMP #31
380 BCS notspaces
390 LDA #13
400 STA buffer,X
410 :
420 LDA #&40
430 LDX #buffer MOD 256
440 LDY #buffer DIV 256
450 JSR osfind
460 TAY
470 BEQ notopen
480 :
490 LDA #0
500 PHA
510 .loop
520 JSR osascii
530 JSR osbget
540 BIT escflag
550 BMI close
560 BCC loop
570 :
580 .close
590 PLA
600 JSR osfind
610 RTS
620 :
630 .notopen
640 BRK
650 OPT FNequs (CHR$128+"Not found")
660 .noarg
670 BRK
680 OPT FNequs (CHR$129+"No filename")
690 BRK
700 .buffer
710 ]
720 NEXT
730 :
740 S%=0
750 FOR I%=&900 TO &95E
760 S%=S%+?1%
770 NEXT
780 IF S%<>&2E13 THEN PRINT "Assembler
error - please check listing":END
790 *SAVE PRINT 900 +5F
800 END
810 :
820 DEF FNequs (string$)
830 $P%=$string$
840 P%=$P%+LEN string$
850 =pass

```

Listing 2. Spooled file replayer

```

10 REM Hints & Tips Listing 2
20 REM spool file replayer
30 REM J Chisholm and G Bell
40 REM for BBC B/B+/E
50 REM (C) Acorn User October 1987
60 :
70 block=&A8
80 escflag=&FF
90 osascii=&FFE3
100 osargs=&FFDA
110 osbget=&FFD7
120 osfind=&FFCE
130 :

```

Continued ►

YELLOW PAGES

ACORN FORUM

Listing 4. Testing the printer

```

10 REM Hints & Tips listing 4
20 REM Printer tester
30 REM by Juliet Wilson
40 REM for B/B+/M/C/E/A
50 REM (C) Acorn User October 1987
60 :
70 PROCprinteron
80 FOR I% = 1 TO 10
90 PRINT "Hello"
100 NEXT
110 PROCprinteroff
120 END
130 :
140 DEF PROCprinteron
150 LOCAL space%, time%
160 space%=ADVAL-4
170 VDU 2,1,0,1,0,1,0,1,0
180 time%=TIME
190 REPEAT UNTIL TIME>time%+100
200 IF space%<>ADVAL-4 THEN VDU 3:*FX
210 ENDPROC
220 :
230 DEF PROCprinteroff:VDU 3:ENDPROC

```

See Acorn Forum, page 53

Listing 1. Initialising ROM images

```

10 REM Initialising ROM images
20 REM by Quentin Stafford-Fraser
30 REM for BBC B+128K/M and B with SRAM
40 REM (C) Acorn User October 1987
50 :
60 MODE 7
70 org=&C80
80 DIM space 100
90 FOR opt=4 TO 7 STE
P 3
100 P% = org
110 0% = space
120 LOPT opt
130 .start
140 LDA #170
150 LDX #0
160 LDY #&FF
170 JSR &FFF4
180 STX &72
190 STY &73
200 LDA #15
210 STA &70
220 .loop
230 LDA #&07
240 JSR read
250 CLC
260 ADC #2
270 JSR read
280 CMP #ASC"C"
290 BNE empty
300 LDA #&06
310 JSR read
320 LDY &70
330 STA (&72),Y
340 .empty
350 DEC &70
360 BPL loop
370 LDA #143
380 LDX #&27
390 JSR &FFF4
400 RTS
410 .read
420 STA &F6
430 LDA #&80
440 STA &F7
450 LDY &70
460 JMP &FFB9
470 JNEXT
480 PRINT "Press SPACE to save code"

```

Continued ►

◀ Acorn Forum listing 1 continued

```

490 REPEAT UNTIL GET=3
2
500 PROCoscli ("*SAVE ROMInit "+STR$~space+" "+STR$~0%+" "+STR$~start+" "+STR$~start)
510 END
520 :
530 DEF PROCoscli ($&70
0)
540 PRINT $&700
550 LOCAL X%, Y%
560 Y% = 7
570 CALL &FFF7
580 ENDPROC

```

Listing 2 Fleet St. graphics converter

```

10 REM Fleet St Graphics Converter
20 REM by Jonathan Temple
30 REM for B/B+/M with FSE
40 REM (C) Acorn User October 1987
50 :
60 MODE 4
70 INPUT "FSE picture name : " F$
80 $&700="L. "+F$+" 3
000"
90 X% = 0
100 Y% = 7
110 CALL &FFF7
120 !&5000=0
130 N% = &5800
140 FOR M% = &3604 TO &4
F04 STEP 256
150 FOR K% = 0 TO 252 STEP 4
160 N% !K% = M% !K%
170 NEXT
180 N% = N% + 320
190 NEXT

```

Listing 3. Code key emulator

```

10 REM Code Key Emulator
20 REM by Ian Goldby
30 REM for B/E/B+/M

```

Continued ►

◀ Acorn Forum listing 3 continued

```

40 REM (C) Acorn User October 1987
50 REM Press TAB to toggle
60 :
70 code% = &A00
80 osbyte = &FFF4
90 osrdch = &FFEO
100 rdvec = &210
110 :
120 FOR pass% = 0 TO 3 STEP 3
130 P% = code%
140 LOPT pass%
150 .init
160 LDA rdvec
170 STA start+1
180 LDA rdvec+1
190 STA start+2
200 LDA #start MOD 256
210 STA rdvec
220 LDA #start DIV 256
230 STA rdvec+1
240 LDA #0
250 STA char+1
260 LDA #&DB
270 LDX #0
280 LDY #0
290 JMP osbyte
300 :
310 .start
320 JSR &FFFF
330 BCS out
340 PHP
350 STA char
360 TXA
370 PHA
380 TYA
390 PHA
400 LDA #&81
410 LDX #&9F
420 LDY #&FF
430 JSR osbyte
440 CPX #&FF
450 BEQ toggle
460 :
470 .convert
480 LDA char
490 EOR char+1
500 STA char
510 :
520 .restore
530 PLA
540 TAY

```

Continued ►

YELLOW PAGES

ACORN FORUM

◀ Acorn Forum listing 3 continued

```

550 PLA
560 TAX
570 LDA char
580 PLP
590 .out
600 RTS
610 .toggle
620 LDA #&80
630 EOR char+1
640 STA char+1
650 TAX
660 LDA #&89
670 JSR osbyte
680 PLA
690 TAY
700 PLA
710 TAX
720 LDA char
730 PLP
740 JMP start
750 .char
760 BRK
770 J
780 NEXT pass%
790 :
800 S%=0
810 FOR I% = init TO cha
r
820 S% = S% + ?I%
830 NEXT
840 IF S% < > 11387 PRINT
"Assembler error - please
check listing":END
850 :
860 *SAVE TABCODE A00
+69

```

◀ Acorn Forum listing 4 continued

```

300 LDA wordv+1
310 STA oldv+1
320 LDA #start MOD &10
0
330 STA wordv
340 LDA #start DIV &10
0
350 STA wordv+1
360 .sbasic
370 LDA #&BB
380 LDX #0
390 LDY #&FF
400 JSR osbyte
410 LDA #&8E
420 JMP osbyte
430 :
440 .start
450 CMP #0
460 BEQ us
470 JMP (oldv)
480 .us
490 STY blk+1
500 STX blk
510 LDY #0
520 LDA (blk),Y
530 STA blk+2
540 INY
550 LDA (blk),Y
560 STA blk+3
570 .newline
580 LDY #0
590 .eloop
600 LDA (addr),Y
610 CMP #13
620 BEQ crfnd
630 INY
640 CPY #&E0
650 BNE eloop
660 LDA oldv
670 STA wordv
680 LDA oldv+1
690 STA wordv+1
700 LDA #6
710 JSR osascii
720 LDA #13
730 LDY #0
740 STA (blk+2),Y
750 LDY #0
760 CLC
770 RTS
780 :
790 .crfnd
800 STY temp
810 LDY #&FF
820 .sloop
830 INY
840 LDA (addr),Y
850 CMP #ASC " "
860 BEQ sloop
870 .dloop
880 LDA (addr),Y
890 CMP #ASC "0"
900 BCC notd
910 CMP #ASC "9"+1
920 BCS notd
930 INY
940 BNE dloop
950 .notd
960 TYA
970 BEQ nline
980 LDY #0
990 .ploop
1000 LDA (addr),Y
1010 STA (blk+2),Y

```

◀ Acorn Forum listing 4 continued

```

1020 CMP #13
1030 BEQ endol
1040 INY
1050 BNE ploop
1060 :
1070 .endol
1080 TYA
1090 SEC
1100 ADC addr
1110 STA addr
1120 BCC out
1130 INC addr+1
1140 CLC
1150 .out
1160 DEY
1170 RTS
1180 :
1190 .nline
1200 LDA temp
1210 SEC
1220 ADC addr
1230 STA addr
1240 LDA addr+1
1250 ADC #0
1260 STA addr+1
1270 CLC
1280 BCC newline
1290 :
1300 .tcall
1310 LDX #blk MOD &100
1320 LDY #blk DIV &100
1330 JMP &406
1340 :
1350 .bmess
1360 OPT FNequs("BASIC")
)
1370 OPT FNequub(13)
1380 OPT FNequub(13)
1390 OPT FNequub(21)
1400 :
1410 .chk
1420 LDX #blk
1430 LDY #0
1440 LDA #1
1450 JSR osargs
1460 LDX #20
1470 .cloop
1480 LDA (blk),Y
1490 CMP #13
1500 BEQ sbasic2
1510 CMP #ASC "@"
1520 BEQ atfnd
1530 INY
1540 DEX
1550 BNE cloop
1560 .sbasic2
1570 JMP sbasic
1580 :
1590 .atfnd
1600 INY
1610 LDA (blk),Y
1620 CMP #13
1630 BEQ atfnd7
1640 DEY
1650 LDA #0
1660 STA blk+2
1670 STA blk+3
1680 .atfnd2
1690 INY
1700 LDA (blk),Y
1710 CMP #13
1720 BEQ atfnd5

```

Listing 4. Basic @addr emulator

```

10 REM BASIC @<addr>
emulator
20 REM by David Spencer
30 REM for B/B+/E
40 REM (C) Acorn User
October 1987
50 :
60 addr=&60
70 nlf=&62
80 temp=&63
90 oldv=&64
100 blk=&66
110 DIM cli% &30
120 :
130 wordv=&20C
140 osargs=&FFDA
150 osascii=&FFE3
160 osbyte=&FFF4
170 :
180 FOR pass=0 TO 3 ST
EP 3
190 P%=&900
200 LOPT pass
210 JMP chk
220 :
230 .setaddr
240 LDA 0
250 STA addr
260 LDA 1
270 STA addr+1
280 LDA wordv
290 STA oldv

```

Continued ►

Continued ►

Continued ►

YELLOW PAGES

ACORN FORUM

◀ Acorn Forum listing 4 continued

```

1730 CMP #ASC"0"
1740 BCC sbasic2
1750 CMP #ASC"9"+1
1760 BCC atfnd3
1770 AND #&DF
1780 CMP #ASC"A"
1790 BCC sbasic2
1800 CMP #ASC"F"+1
1810 BCS sbasic2
1820 SBC #6
1830 .atfnd3
1840 AND #&F
1850 PHA
1860 LDX #4
1870 .atfnd4
1880 ASL blk+2
1890 ROL blk+3
1900 BCS sbasic2
1910 DEX
1920 BNE atfnd4
1930 PLA
1940 ORA blk+2
1950 STA blk+2
1960 JMP atfnd2
1970 .atfnd5
1980 JSR tchk
1990 TXA
2000 BNE atfnd6
2010 LDA blk+2
2020 STA 0
2030 LDA blk+3
2040 STA 1
2050 JMP atfnd7
2060 .atfnd6
2070 LDA #3
2080 LDX #tb MOD &100
2090 LDY #tb DIV &100
2100 JSR &406
2110 LDA blk+2
2120 STA &FEE5
2130 LDA blk+3
2140 STA &FEE5
2150 .atfnd7
2160 LDY #0
2170 .ploop
2180 LDA bmess,Y
2190 JSR osascii
2200 INY
2210 CPY #8
2220 BNE ploop
2230 JSR tchk
2240 TXA
2250 BNE tcopy
2260 JMP setaddr
2270 :
2280 .tcopy
2290 LDA #0
2300 STA blk
2310 STA blk+2
2320 STA blk+3
2330 LDA #6
2340 STA blk+1
2350 LDA #7
2360 JSR tcall
2370 LDY #0
2380 .wloop
2390 LDA &900,Y
2400 CPY #&1B
2410 BNE wait
2420 LDA #6
2430 .wait
2440 BIT &FEE4
2450 BVC wait

```

Continued ►

◀ Acorn Forum listing 4 continued

```

2460 STA &FEE5
2470 INY
2480 BNE wloop
2490 LDA #setaddr MOD &
100
2500 STA blk
2510 LDA #6
2520 STA blk+1
2530 LDA #4
2540 JMP tcall
2550 :
2560 .tchk
2570 LDA #&EA
2580 LDX #0
2590 LDY #&FF
2600 JMP osbyte
2610 :
2620 .tb
2630 BRK:BRK:BRK:BRK
2640 :
2650 JNEXT
2660 :
2670 IF NOT FNchecksum
THEN PRINT "Assembler er
ror - please check listi
ng":END
2680 PROCoscli("SAVE BA
SIC 900 A93 FFFF0900 FFF
F0900")
2690 END
2700 :
2710 DEF FNequb(byte%)
2720 ?P%=byte%
2730 P%=P%+1
2740 =pass
2750 :
2760 DEF FNequs(text$)
2770 $P%=text$
2780 P%=P%+LEN text$
2790 =pass
2800 :
2810 DEF FNchecksum
2820 S%=0
2830 FOR I%=&900 TO &A9
2
2840 S%=S%+?I%
2850 NEXT
2860 =(S%=&B80A)
2870 :
2880 DEF PROCoscli($cli
%)
2890 X%=&cli%
2900 Y%=&cli% DIV 256
2910 CALL &FFF7
2920 ENDPROC

```

Listing 5. Auto-Off screen saver

```

10 REM AutoOff screen
saver
20 REM by David Acton
30 REM for BBC B/B+/M
/C
40 REM (C) Acorn User
October 1987
50 :
60 PROCvar
70 PROCass
80 IF FNchecksum THEN
*SAVE AUTOOFF FFFF0A00
+100

```

Continued ►

◀ Acorn Forum listing 5 continued

```

90 END
100 :
110 DEF PROCvar
120 code%=&A00
130 FOR I%=&code% TO co
de%+&FF
140 ?I%=0
150 NEXT
160 osbyte=&FFFF
170 osword=&FFFF1
180 oldeventv=?&220+25
6*?&221
190 oldreadv=?&210+256
*?&211
200 ENDPROC
210 :
220 DEF PROCass
230 FOR pass%=&0 TO 3 S
TEP 3
240 P%=&code%
250 I
260 OPT pass%
270 .init
280 LDA #0
290 STA ofonflag
300 LDA #neweventv MOD
256
310 STA &220
320 LDA #neweventv DIV
256
330 STA &221
340 LDA #newreadv MOD2
56
350 STA &210
360 LDA #newreadv DIV2
56
370 STA &211
380 LDA #14
390 LDX #5
400 JSR osbyte
410 .timeset
420 LDX #min5 MOD256
430 LDY #min5 DIV256
440 LDA #4
450 JMP osword
460 :
470 .neweventv
480 PHA
490 STA store
500 TXA
510 PHA
520 TYA
530 PHA
540 LDA store
550 CMP #5
560 BNE nottimeup
570 LDA #1
580 STA ofonflag
590 LDA #48
600 JSR setreg
610 LDA #48
620 JSR sound
630 LDA #96
640 JSR sound
650 LDA #144
660 JSR sound
670 LDA #192
680 JSR sound
690 .nottimeup
700 PLA
710 TAY
720 PLA
730 TAX

```

Continued ►

YELLOW PAGES

JOE'S JOTTINGS

◀ Acorn Forum listing 5 continued

```

740 LDA store
750 PLP
760 JMP oldeventv
770 :
780 .newready
790 PHP
800 PHA
810 TXA
820 PHA
830 TYA
840 PHA
850 LDA ofonflag
860 BEQ notoff
870 LDA #0
880 STA ofonflag
890 JSR setreg
900 .notoff
910 JSR timeset
920 PLA
930 TAY
940 PLA
950 TAX
960 PLA

970 PLP
980 JMP oldready
990 :
1000 .setreg
1010 STA setor+1
1020 LDA #8
1030 STA &FE00
1040 LDA #160
1050 LDX #&55
1060 JSR osbyte
1070 LDA #1
1080 CPX #7
1090 BNE setor
1100 LDA #147
1110 .setor
1120 ORA #0
1130 STA &FE01
1140 RTS
1150 .sound
1160 STA beep+4
1170 LDA #7
1180 LDX #beep MOD256
1190 LDY #beep DIV256
1200 JMP osword
1210 .ofonflag BRK

1220 .store BRK
1230 .min5 BRK:BRK:BRK:
BRK:BRK
1240 .beep
1250 I
1260 NEXT
1270 ?min5=&DO:min5!1=&
FFFFFFFFFF8A
1280 ?beep=1:beep?2=&FA
:beep?3=&FF
1290 beep?6=1
1300 ENDPROC
1310 :
1320 DEF FNchecksum
1330 J%=&0
1340 FOR I%=&code% TO co
de%+&FF
1350 J%=&J%+?I%
1360 NEXT
1370 IF J%=&4CFF THEN =
TRUE
1380 PRINT "Assembler e
rror - please check list
ing"
1390 END

```

See Joe's Jottings, page 81

Listing 1. File creator

```

10 REM File Creator
20 REM By Joe Telford
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User October 1987
50 :
60 CLOSE# 0
70 ch% = OPENOUT("Clubdat")
80 RESTORE
90 reclen% = 277
100 recno% = 0
110 READ fields%
120 REPEAT
130 recno% = recno% + 1
140 PTR# ch% = recno% * reclen%
150 READ item$
160 IF item$ <> "**END**" THEN PROCtxfie
lds
170 UNTIL item$ = "**END**"
180 PRINT item$
190 PTR# ch% = 0
200 PRINT# ch%, recno% - 1, fields%, reclen
%
210 CLOSE# ch%
220 END
230 :
240 DEF PROCtxfields
250 PRINT# ch%, item$: PRINT item$
260 FOR field% = 2 TO fields%
270 READ item$
280 PRINT# ch%, item$
290 PRINT item$
300 NEXT
310 PRINT .
320 ENDPROC
330 :
340 DATA 11
350 DATA Smith, John, Mr, 131 Wakefield P
ark, Summerton, Cheshire, TX13 4BZ, 092 3452
23, Pd, Canon T90, B&W
360 DATA Johnson, Sue, Mrs, 63 Ravenswort
h Ave, Witford, Wotshire, WA11 3ED, 0320 223
8900, Due, Konica FS1, Print

```

Continued ►

◀ Joe's Jottings listing 1 continued

```

370 DATA Jones, James, Mr, The Tall Tress
, Westmanster, Yorks, BP2 3TT, 0652 2316678,
Pd, Nikon F301, Slide
380 DATA Singh, Ravi, Mr, 1 Upminster Roa
d, Buiton, Berks, BU56 2BF, 0229 239846, Due,
Leica M3, B&W
390 DATA Pert, Pamela, Mrs, 23 The Avenue
, St. Alberts, Lincs, ST1 1TT, 0234 983733, P
d, Pentax ME, Print
400 DATA Coothers, Sally, Miss, Glass Lan
e, Southorp, Cumberland, QW3 8FT, 0653 54587
1, Due, Minolta 7000, Slide
410 DATA Hopen, Iris, Ms, The Gallery, Low
er Stoppington, Dorset, PW23 4TY, 0818 54525
7, Pd, Canon FTb, B&W
420 DATA Jottings, Joe, Mr, Telford Tower
s, Eaglesridge, Cleverland, RS15 8HD, 0425 1
43792, Due, Box Brownie, Slide
430 DATA Quinn, Antonius, Sir, Strungfell
ows, Liverton, Bathshire, LL2 2LL, 0236 5428
84, Pd, Canon EOS, Print
440 DATA Alex, Mad, Mr, The Dungeon, Redwo
od Place, London, WC2B 5TF, 01 836 2441, Due
, Zenit B, B&W
450 DATA **END**

```

Listing 2. File loader

```

10 REM File loader
20 REM by Joe Telford
30 REM for BBC B/B+/M/C/E/A
40 REM (C) Acorn User Oct 1987
50 :
60 CLOSE# 0
70 PROCreadfile("Clubdat")
80 PROCaddressdata
90 END
100 :
110 DEF PROCreadfile(name$)
120 ch% = OPENIN(name$)
130 INPUT# ch%, recno%, fields%, reclen%

```

Continued ►

YELLOW PAGES

JOE'S JOTTINGS

◀ Joe's Jottings listing 2 continued

```

140 items% = recno% * fields%
150 DIM file$(recno%, fields%)
160 FOR record% = 1 TO recno%
170 PRINT ;recno% - record%; " records to
read "
180 VDU 11
190 PTR# ch% = record% * reclen%
200 FOR field% = 1 TO fields%
210 INPUT# ch%, file$(record%, field%)
220 NEXT
230 NEXT
240 CLOSE# ch%
250 PRINT ' "All read"
260 ENDPROC
270 :
280 DEF PROCaddressdata
290 FOR record% = 1 TO recno%
300 PRINT file$(record%, 3); " "; file$(r
ecord%, 2); " "; file$(record%, 1)
310 FOR field% = 4 TO 7
320 PRINT file$(record%, field%)
330 NEXT
340 RESTORE
350 FOR field% = 8 TO 11
360 READ name$
370 PRINT name$; " "; file$(record%, fie
ld%)
380 NEXT
390 PRINT
400 NEXT
410 ENDPROC
420 :
430 DATA Phone, Subs, Camera type, Entry
440 :
450 DEF PROCtime
460 PRINT ;TIME/100;" seconds to sort
";recno%; " records of ";fields%; " fields
"
470 PRINT "Press SPACE to continue"
480 REPEAT UNTIL GET=32
490 ENDPROC
500 :
510 DEF PROCswap(rec1%, rec2%)
520 PRINT rec1%; " - "; rec2%
530 FOR field% = 1 TO fields%
540 spare$(field%) = file$(rec1%, field%)
550 file$(rec1%, field%) = file$(rec2%, fi
eld%)
560 file$(rec2%, field%) = spare$(field%)
570 NEXT
580 ENDPROC

```

Listing 3. Exchange sort

```

10 REM File sort 1 - Exchange sort
20 REM By Joe Telford
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User October 1987
50 :
60 CLOSE #0
70 PROCreadfile("Clubdat")
80 DIM spare$(fields%)
90 PROCechange(1)
100 PROCaddressdata
110 END
120 :
130 DEF PROCechange(f%)
140 PRINT "Exchange sorting on field ";
f%:TIME=0
150 LOCAL loop1%, loop2%
160 FOR loop1% = 1 TO recno%-1

```

Continued ►

◀ Joe's Jottings listing 3 continued

```

170 ptr% = loop1%
180 FOR loop2% = loop1% + 1 TO recno%
190 IF file$(loop2%, f%) < file$(ptr%, f%)
THEN ptr% = loop2%
200 NEXT
210 IF ptr% <> loop1% THEN PROCswap(ptr%
, loop1%)
220 NEXT
230 PROCtime
240 ENDPROC

```

Listing 4. Bubble sort

```

10 REM File sort 2 - Bubble sort
20 REM By Joe Telford
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User October 1987
50 :
60 CLOSE# 0
70 PROCreadfile("Clubdat")
80 DIM spare$(fields%)
90 PROCbubble(1)
100 PROCaddressdata
110 END
120 :
130 DEF PROCbubble(f%)
140 PRINT "Bubble Sorting on field ";f
%:TIME=0
150 LOCAL loop1%, loop2%, last%
160 last% = recno%-1
170 FOR loop1% = 1 TO recno%
180 flag% = 0
190 FOR loop2% = 0 TO last%
200 IF file$(loop2%, f%) > file$(loop2% + 1
, f%) THEN PROCswap(loop2%, loop2% + 1): flag
% = 1
210 NEXT loop2%
220 last% = last% - 1
230 IF flag% = 0 THEN loop1% = recno%
240 NEXT loop1%
250 PROCtime
260 ENDPROC

```

Listing 5. Shell-Metzner sort

```

10 REM File sort 3 - Shell Metzner
20 REM By Joe Telford
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User October 1987
50 :
60 CLOSE# 0
70 PROCreadfile("Clubdat")
80 DIM spare$(fields%)
90 PROCshmsort(1)
100 PROCaddressdata
110 END
120 :
130 DEF PROCshmsort(f%)
140 PRINT "Shell-Metzner sort on field
"; f%:TIME=0
150 lists% = recno%
160 REPEAT
170 lists% = lists% / 2
180 IF lists% = 0 THEN GOTO 310
190 FOR list% = 0 TO lists% - 1
200 REPEAT
210 flag% = 0
220 ptr1% = list%
230 ptr2% = list% + lists%
240 REPEAT

```

Continued ►

YELLOW PAGES

CONTROL

◀ Joe's Jottings listing 5 continued

```

250 IF file$(ptr1%, f%)>file$(ptr2%, f%)
THEN PROCswap(ptr1%,ptr2%):flag%=1
260 ptr1%=ptr2%
270 ptr2%=ptr2%+lists%
280 UNTIL ptr2%>recno%+1
290 UNTIL flag%=0
300 NEXT list%
310 UNTIL lists%=0
320 PROCtime
330 ENDPROC

```

◀ Gain Control listing 1 continued

```

10140 *KEY 7 "FOR x = 1 TO "
10150 *KEY 8 "NEXT:IM"
10160 *KEY 9 "PROChelp:IM"
10170 *KEY 10 "OLD:MRUN:IM"
10180 ENDPROC
10190 :
10200 DEF PROCon(N)
10210 IF FNout(N) LET N=0
10220 switch%=switch%+N
10230 PROCswitch
10240 ENDPROC
10250 :
10260 DEF FNout(N)
10270 IF (switch% AND N)=0 THEN =FALSE ELSE =TRUE
10280 :
10290 DEF PROCpause(T)
10300 TIME=0
10310 REPEAT UNTIL TIME>INT(100*T)
10320 ENDPROC
10330 :
10340 DEF PROCoff(N)
10350 IF FNout2(N) THEN N=0
10360 switch%=switch%-N
10370 PROCswitch
10380 ENDPROC
10390 :
10400 DEF FNout2(N)
10410 IF (switch%-N AND N)=0 THEN =FALSE ELSE =TRUE
10420 :
10430 DEF PROCreset
10440 PROCsetup1
10450 switch%=0
10460 PROCswitch
10470 ENDPROC
10480 :
10490 DEF PROCbeep
10500 SOUND 1,-15,150,3
10510 ENDPROC
10520 :
10530 DEF PROChelp
10540 CLS
10550 COLOUR 3
10560 VDU 23,1,0;0;0;0;
10570 PRINT "The following commands are
available:---"
10580 PRINT "PROCon(n)...Switches ON
e.g. PROCon(A) switches on the red light"
10590 PRINT "PROCon(A+E)...the
+ sign is used when more than one light
is switched"
10600 PRINT "PROCoff(n)...Switches OFF"
10610 PRINT "PROCpause(t)...Delays for a
given time in seconds e.g. PROCpause(.5)
pauses for half a second"
10620 PRINT "PROCreset...Switches OFF
ALL lights"
10630 PRINT "PROCbutton...Halts the
program until SPACE BAR is pressed"
10640 PRINT "PROCbeep....Makes a short
beep sound"
10650 COLOUR 2:PRINT "Press SPACE BAR to
continue":PROCbutton
10660 CLS
10670 COLOUR 3
10680 PRINT "Looping"
10690 PRINT "When a group of commands"
10700 PRINT "are to be repeated use"
10710 PRINT "FOR x = 1 TO ?"
10720 PRINT "followed by the commands"

```

Listing 6. Random file creator

```

10 REM Random file creator
20 REM By Joe Telford
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User October 1987
50 :
60 CLOSE# 0
70 ch%OPENOUT ("Clubdat")
80 RESTORE
90 reclen%=277
100 fields%=11
110 FOR record%=1 TO 100
120 PRINT "Writing record ";record%
130 VDU 11
140 PTR# ch% = record%*reclen%
150 FOR field%=1 TO fields%
160 N$=STR$(RND(10000000))
170 PRINT# ch%,N$
180 NEXT
190 NEXT
200 PTR# ch% = 0
210 PRINT
220 PRINT# ch%,record%-1,fields%,reclen%
n%
230 CLOSE# ch%
240 END

```

See Gain Control, page 95

Listing 1. Light control demonstration

```

1 REM Light control demonstration
2 REM by Peter Julian
3 REM for BBC B/B+/M/C/E/A
4 REM (C) Acorn User October 1987
5 :
6 ON ERROR VDU 4:REPORT:PRINT " at 1
ine ";ERL:END
7 MODE 1:VDU 24,870;0;1279;1023;28;3
1,26;19,3,2;0;
8 PROCdisplay2:PROCsetup2:PROCreset
9 :
10 PRINT """Type in your traffic ligh
t program, """beginning at line 10"""
999 END
10000 REM main procedures
10010 :
10020 DEF PROCsetup1
10030 A=1:B=2:C=4:D=8
10040 E=16:F=32:G=64:H=128
10050 ENDPROC
10060 :
10070 DEF PROCsetup2
10080 *KEY 0 "PROCreset:IM"
10090 *KEY 1 "PROCon()"
10100 *KEY 2 "PROCoff()"
10110 *KEY 3 "PROCpause()"
10120 *KEY 4 "CLSM LIST 10,9999:IM"
10130 *KEY 5 "RUN:IM"

```

Continued ►

Continued ►

YELLOW PAGES

CONTROL

◀ Gain Control listing 1 continued

```

10730 PRINT "which are to be repeated."
10740 PRINT "Finish with NEXT"
10750 PRINT "'?' stands for the number"
10760 PRINT "of times the sequence is"
10770 PRINT "is repeated and should be"
10780 PRINT "replaced by a number eg:-"
10790 PRINT "10 FOR x = 1 TO 6"
10800 PRINT "20 PROCon(B)"
10810 PRINT "30 PROCpause(1)"
10820 PRINT "40 PROCoff(B)"
10830 PRINT "50 PROCpause(1)"
10840 PRINT "60 NEXT"
10850 PRINT "This makes the amber light"
10860 PRINT "flash 6 times."
10870 PRINT "Use red function keys f7,f8"
"
10880 PRINT "Also use RUN and LIST on"
10890 PRINT "the function keys"
10900 COLOUR 2
10910 PRINT "Start line numbering at 10"
10920 COLOUR 3
10930 VDU 23,1,1;0;0;0;
10940 ENDPROC
10950 :
10960 DEF PROCsign(c)
10970 VDU 5
10980 GCOL 0,c
10990 MOVE 908,300
11000 PRINT "WAIT"
11010 VDU 4
11020 ENDPROC
11030 :
11040 DEF PROCdisplay2
11050 LOCAL J
11060 VDU 5
11070 GCOL 0,2
11080 MOVE 950,0
11090 RESTORE 11130
11100 FOR J=1 TO 11
11110 READ a,b
11120 DRAW a,b
11130 DATA 950,250,900,250,900,320,950,3
20,950,384
11140 DATA 990,384,990,320,1040,320,1040
,250,990,250,990,0
11150 NEXT
11160 MOVE 920,384:DRAW 1020,384
11170 DRAW 1020,610:DRAW 920,610
11180 DRAW 920,384
11190 MOVE 1200,0:DRAW 1200,384
11200 DRAW 1240,384:DRAW 1240,0
11210 MOVE 1170,384:DRAW 1270,384
11220 DRAW 1270,610:DRAW 1170,610
11230 DRAW 1170,384
11240 GCOL 0,1:MOVE 875,0
11250 DRAW 875,1024:GCOL 0,2
11251 PROClist
11260 VDU 4
11270 ENDPROC
11280 :
11290 DEF PROCrman(x)
11300 VDU 5
11310 GCOL 0,x
11320 MOVE 956,600:PRINT"o"
11330 MOVE 970,590
11340 DRAW 970,550:DRAW 955,510
11350 MOVE 985,510
11360 DRAW 970,550:MOVE 955,550
11370 DRAW 970,590:DRAW 985,550
11380 VDU 4
11390 ENDPROC
11400 :

```

Continued ►

◀ Gain Control listing 1 continued

```

11410 DEF PROCgman(x)
11420 VDU 5
11430 GCOL 0,x
11440 MOVE 956,495:PRINT"o"
11450 MOVE 970,485:DRAW 970,435
11460 DRAW 960,395:MOVE 1000,390
11470 DRAW 970,435:MOVE 995,435
11480 DRAW 970,470:DRAW 955,450
11490 DRAW 970,435
11500 VDU 4
11510 ENDPROC
11520 :
11530 DEF PROCalight(x)
11540 VDU 5
11550 GCOL 0,x
11560 MOVE 1206,580:PRINT "*"
11570 MOVE 1206,580:PRINT "O"
11580 VDU 4
11590 ENDPROC
11600 :
11610 DEF PROCblight(x)
11620 VDU 5
11630 GCOL 0,x
11640 MOVE 1206,511:PRINT "*"
11650 MOVE 1206,511:PRINT "O"
11660 VDU 4
11670 ENDPROC
11680 :
11690 DEF PROCcilight(x)
11700 VDU 5
11710 GCOL 0,x
11720 MOVE 1206,440:PRINT "*"
11730 MOVE 1206,440:PRINT "O"
11740 VDU 4
11750 ENDPROC
11760 :
11770 DEF PROCswitch
11780 IF(switch% AND A)=0 THEN PROCaligh
t(0) ELSE PROCalight(1)
11790 IF(switch% AND B)=0 THEN PROCbligh
t(0) ELSE PROCblight(2)
11800 IF(switch% AND C)=0 THEN PROCcilight(0) ELSE PROCcilight(3)
11810 IF(switch% AND D)=0 THEN PROCrman(0) ELSE PROCrman(1)
11820 IF(switch% AND E)=0 THEN PROCgman(0) ELSE PROCgman(3)
11830 IF(switch% AND F)=0 THEN PROCsign(0) ELSE PROCsign(2)
11840 ENDPROC
11850 :
11860 DEF PROCbutton
11870 *FX 21,0
11880 REPEAT UNTIL GET$=CHR$(20)
11890 ENDPROC
11900 :
11910 DEF PROClist
11920 VDU 5
11930 MOVE 885,1000
11940 PRINT "Red light...A"
11950 MOVE 885,950
11960 PRINT "Amber .....B"
11970 MOVE 885,900
11980 PRINT "Green .....C"
11990 MOVE 885,850
12000 PRINT "Red man ...D"
12010 MOVE 885,800
12020 PRINT "Green man..E"
12030 MOVE 885,750:PRINT "WAIT.....F"
12040 VDU 4
12050 ENDPROC

```

YELLOW PAGES

CONTROL

Listing 2. User port control

```

1 REM User port control
2 REM by Peter Julian
3 REM for BBC B/B+/M with interface
4 REM (C) Acorn User October 1987
5 :
6 ON ERROR VDU 4:REPORT:PRINT " at 1
ine "; ERL:END
7 MODE 1:VDU 24,0;900;1279;1023;28,0
,31,39,4:GCOL 0,129:CLG:*FX 229,0
8 PROCdisplay:PROCresest
9 :
10 PRINT '''Type in your control program,'''beginning at line 10'''
999 END
10000 REM main procedures
10010 :
10020 DEF PROCsetup
10030 A=1:B=2:C=4:D=8:E=16:F=32:G=64:H=1
28
10040 *KEY 0 "PROCresest:M"
10050 *KEY 1 "PROCon()"
10060 *KEY 2 "PROCoff()"
10070 *KEY 3 "PROCpause()"
10080 *KEY 4 "CLS:LIST 10,9999:M"
10090 *KEY 5 "RUN:M"
10100 *KEY 6 "FNinputon()"
10110 *KEY 7 "FOR x = 1 TO "
10120 *KEY 8 "NEXT:M"
10130 *KEY 9 "PROCtest:M"
10140 *KEY 10 "OLD:MRUN:M"
10150 ENDPROC
10160 :
10170 DEF PROCon(N)
10180 IF FNout(N) THEN N=0
10190 ?&FE61=?&FE61+N
10200 PROCdisp1
10210 ENDPROC
10220 :
10230 DEF FNout(N)
10240 =((?&FE61 AND N) <> 0)
10250 :
10260 DEF FNinputon(N)
10270 =((?&FE60 AND N) <> 0)
10280 :
10290 DEF PROCpause(T)
10300 TIME=0
10310 REPEAT
10320 UNTIL TIME>INT(100*T)
10330 ENDPROC
10340 :
10350 DEF PROCoff(N)
10360 IF FNout2(N) THEN N=0
10370 ?&FE61=?&FE61-N
10380 PROCdisp1
10390 ENDPROC
10400 :
10410 DEF FNout2(N)
10420 =((?&FE61-N AND N) <> 0)
10430 :
10440 DEF PROCresest
10450 PROCsetup
10460 ?&FE61=0
10470 PROCdisp1
10480 ENDPROC
10490 :
10500 DEF PROCbeep
10510 SOUND 1,-15,150,3
10520 ENDPROC
10530 :
10540 DEF PROCdisplay
10550 LOCAL Y
10560 VDU 5
10570 GCOL 0,2
10580 MOVE 10,965

```

Continued ►

◀ Gain Control listing 2 continued

```

10590 PRINT "OUTPUTS"
10600 MOVE 300,990
10610 PRINT "H G F E D C B
A"
10620 RESTORE 10700
10630 FOR T=1 TO 8
10640 READ Y
10650 MOVE Y,950
10660 GCOL 0,0
10670 PRINT "O"
10680 NEXT
10690 VDU 4
10700 DATA 300,428,557,684,815,940,1070,
1198
10710 ENDPROC
10720 :
10730 DEF PROCdisp1
10740 RESTORE 10830
10750 FOR J=1 TO 8
10760 LOCAL X,Z
10770 READ X,Z
10780 VDU 5
10790 MOVE Z,950
10800 IF (?&FE61 AND X)=0 THEN GCOL 0,0:P
RINT "O":ELSE GCOL 0,3:PRINT "O"
10810 NEXT J
10820 VDU 4
10830 DATA 128,300,64,428,32,557,16,684
10840 DATA 8,815,4,940,2,1070,1,1198
10850 ENDPROC
10860 :
10870 DEF PROCbutton
10880 *FX 21,0
10890 REPEAT UNTIL GET$=CHR$(&20)
10900 ENDPROC
10910 :
10920 DEF PROCtest1
10930 LOCAL X,p
10940 RESTORE 10990
10950 FOR J=1 TO 8
10960 READ X,p
10970 IF (?&FE60 AND X)=0 THEN PRINT TAB
(p,10) "O" ELSE COLOUR 2:PRINT TAB(p,10)
"O":COLOUR 3
10980 NEXT J
10990 DATA 1,29,2,26,4,23,8,20,16,17,32,
14,64,11,128,8
11000 ENDPROC
11010 :
11020 DEF PROCtest
11030 VDU 23,1,0;0;0;0;
11040 CLS
11050 PRINT TAB(12,6) "* Input Test *"
11060 PRINT TAB(8,8) "H G F E D C
B A"
11070 COLOUR 1
11080 PRINT TAB(0,13) "PROCtest cannot b
e used in a program"
11090 COLOUR3
11100 REPEAT
11110 PROCtest1
11120 UNTIL INKEY -99
11130 PRINT TAB(0,15)
11140 END

```

Gain Control. Crossing lights by 13-year-old Stephen Cripps

```

10 PROCon (D+C)
20 PROCbutton
30 PROCon (F)
40 PROCpause (2)
50 PROCoff (C)

```

Continued ►

YELLOW PAGES

NETWORK PAGE

◀ Gain Control listing 3 continued

```

60 PROCOn (B)
70 PROCPause (2)
80 PROCOFF (F+D+B)
90 PROCOn (E+A)
100 FOR I% = 1 TO 6
110 PROCbeep
120 PROCPause (0.5)
130 NEXT
140 PROCOFF (E+A)
150 FOR I% = 1 TO 6
160 PROCOn (F+E+B)
170 PROCPause (0.5)
180 PROCOFF (F+E+B)
190 PROCPause (0.5)
200 NEXT
210 GOTO 10

```

Listing 4. Crossing lights program 2 by 10 year-old Jean Paul Bourdais

```

10 PROCOn (C+D)
20 CLS
30 PRINT "Press SPACE bar to start"
40 PROCPbutton
50 CLS
60 PROCOn (F)
70 PROCPause (3)
80 PROCOFF (C)
90 PROCOn (B)
100 PROCPause (3)
110 PROCOFF (B+D+F)
120 PROCOn (A+E)
130 FOR I% = 1 TO 5
140 PROCbeep
150 PROCPause (0.4)
160 NEXT I%
170 PROCOFF (A)
180 PROCOn (B)
190 FOR I% = 1 TO 5
200 PROCOn (B+E)
210 PROCPause (0.2)
220 PROCOFF (B+E)
230 PROCPause (0.2)
240 NEXT I%
250 PROCreset
260 GOTO 10

```

See Network Page, page 153

Listing 1. Cataloguer program

```

10 REM Network Catalogue Program
20 REM by Robin Newman
30 REM for BBC B/B+/M/C with Econet
40 REM (C) Acorn User October 1987
50 :
60 MODE 7
70 *NET
80 PROCinit
90 ON ERROR PROCerror:END
100 :
110 fc=yellow: REM file
120 dc=magenta: REM directory
130 barc=blue: REM highlight bar
140 hlc=magenta: REM text highlight
150 ownc=white: REM dir. owner
160 pubc=blue: REM dir. public
170 txtc=green: REM text instr.
180 :
190 PROCtitle
200 PROCwait(0.01)

```

Continued ►

◀ Network Page listing 1 continued

```

210 PROCassm
220 path$(0)=MID$(FNprivname, 2)
230 REPEAT
240 CALL code
250 IF pb?3<>0 THEN END
260 N%=?num
270 newdir=FALSE
280 page=0
290 pagemax=N% DIV 45
300 LMAX%=0
310 PROCDisplay(0)
320 IF newdir UNTIL FALSE
330 PROCInstructions
340 PROCselect
350 UNTIL FALSE
360 :
370 DEF FNsj
380 LOCAL A%, X%, Y%
390 ?data=0: data!1=10: data!3=25
400 X% = data MOD 256
401 Y% = data DIV 256
410 A%=&14
411 CALL osword
420 =(LEFT$( $(data+4), 2) = "SJ")
440 :
450 DEF PROCassm
460 FOR Z% = 0 TO 2 STEP 2
461 P% = code
470 LOPT Z%
480 LDA #(pb+6) MOD 256
490 STA &70
500 LDA #(pb+6) DIV 256
510 STA &71
520 LDA #data MOD 256
530 STA &72
540 LDA #data DIV 256
550 STA &73
560 LDA #0
570 STA pt
580 STA num
590 .nxtbit
600 JSR copy
610 LDA pt
620 STA pb+8
630 JSR call
640 LDA pb+3
650 BEQ ok
660 .error
670 LDY #4
680 .errlp
690 LDA pb, Y
700 JSR osascii
710 INY
720 CMP #13
730 BNE errlp
740 RTS
750 .ok
760 JSR shift
770 LDA pb+4
780 PHA
790 CLC
800 ADC num
810 STA num
820 PLA
830 CMP #4
840 BNE exit
850 LDA pt
860 CLC
870 ADC #4
880 STA pt
890 BNE nxtbit
900 .exit
910 RTS

```

Continued ►

YELLOW PAGES

NETWORK PAGE

◀ Network Page listing 1 continued

```

920 .shift
930 LDY#107
940 .nxsh
950 LDA (&70),Y
960 STA (&72),Y
970 DEY
980 BPL nxsh
990 LDA #108
1000 CLC
1010 ADC &72
1020 STA &72
1030 BCC skip
1040 INC &73
1050 .skip
1060 RTS
1070 .call
1080 LDA #&14
1090 LDX #pb MOD 256
1100 LDY #pb DIV 256
1110 JMP osword
1120 .copy
1130 LDY #19
1140 .nxy
1150 LDA p2,Y
1160 STA pb,Y
1170 DEY
1180 BPL nxy
1190 RTS
1200 .getname
1210 LDY seek
1220 LDA #data MOD 256
1230 STA &74
1240 LDA #data DIV 256
1250 STA &75
1260 CPY #0
1270 BEQ got
1280 CLC
1290 .nxseek
1300 LDA &74
1310 ADC #27
1320 STA &74
1330 LDA #0
1340 ADC &75
1350 STA &75
1360 DEY
1370 BNE nxseek
1380 .got
1390 LDY #9
1400 .place
1410 LDA (&74),Y
1420 STA F+1,Y
1430 DEY
1440 BPL place
1450 LDA #13
1460 STA F+11
1470 LDY #18
1480 LDA (&74),Y
1490 AND #&20
1500 BNE dir
1510 LDA #fc
1520 BNE colour
1530 .dir
1540 LDA#dc
1550 .colour
1560 STA F
1570 RTS
1580 OPT FNdata
1590 J
1591 NEXT
1600 $name=""
1610 ENDPROC
1620 :
1630 DEF FNname(S%)

```

Continued ►

◀ Network Page listing 1 continued

```

1640 ?seek=S%
1650 CALL getname
1660 =$F
1670 :
1680 DEF PROCaddr (S%)
1690 L$=STR$~data! (S%*27+10)
1700 E$=STR$~data! (S%*27+14)
1710 S$=STR$~((data! (S%*27+24)) AND&FFFF
FF)
1720 ac%=(data? (S%*27+18))
1730 IF FNowner(entry) THEN ra%=((ac%AN
D4)<>0) ELSE ra%=((ac%AND1)<>0)
1740 ac$=FNas(ac%)
1750 IF sj% AND (ac%AND&40)<>0 ac$="P"+
ac$
1760 ENDPROC
1770 :
1780 DEF FNas(ac%)
1790 LOCAL X%,A%
1800 atr$=FNatrib
1810 FOR X%=1 TO 6
1820 IF X%>5 A$=A$+"/"
1830 IF (ac% AND &20)=&20 A$=A$+MID$(at
r$,X%,1)
1840 ac%=(2*ac%) AND &3F
1850 NEXT
1860 =A%
1870 :
1880 DEF FNatrib
1890 IF NOT sj% THEN ="DLWRWR"
1900 IF FNowner(entry) THEN ="DLWRwr"
1910 ="DLwrWR"
1920 :
1930 DEF PROCdisplay(P%)
1940 CLS
1950 VDU 28,0,19,39,3
1960 VDU 31,39,15,156
1970 PROCboxoff
1980 IF up THEN page=P(p):P%=page*45
1990 IF page>0 THEN PRINT TAB(0,0) CHR$(
hlc;"[ More Files"
2000 PRINT TAB(15,0) FNprivname
2010 IF page<pagemax THEN PRINT TAB(27,
0) CHR$hlc;"More Files ]";
2020 IF N%>0 THEN PRINT TAB(5,5) CHR$tx
tc;"No files: empty directory!"
2021 IF N%>0 AND p>0 THEN PROCupdir
2030 IF N%>0 THEN ENDPROC
2040 end% = FALSE
2050 FOR C%=0 TO 2
2060 B% = P% + C%*15
2070 V% = N% - 1 - B%
2080 H% = C%*13 + 2
2090 FOR L% = 0 TO 14
2100 IF L% > V% THEN end% = TRUE: LMAX% = B% + L
%-1 - P%: L% = 14: GOTO 2120
2110 PRINT TAB(H%,L%+1) FNname(B%+L%);
2120 NEXT
2130 IF end% THEN C% = 2
2140 NEXT
2150 ENDPROC
2160 :
2170 DEF PROCselect
2180 IF N% = 0 THEN PROCs: PROCexit: END
2190 LOCAL X%,Y%,S%
2200 IF up THEN S% = S(p): NS% = S%: page = P(p
) ELSE S% = 0: NS% = 0
2210 REPEAT
2220 X% = 13 * (S% DIV 15)
2230 Y% = 1 + S% MOD 15
2240 IF NOT (X% > 25 AND Y% = 15) THEN VDU 3
1, X% + 13, Y%, 156
2250 VDU 31, X%, Y%, barc, 157

```

Continued ►

YELLOW PAGES

NETWORK PAGE

◀ Network Page listing 1 continued

```

2260 up=FALSE
2270 TIME=0
2280 REPEAT UNTIL FNkeyclear OR TIME>5+
delay
2290 delay=0
2300 IF INKEY(-42) THEN NS%=S%+1:GOTO23
70
2310 IF INKEY(-58) THEN NS%=S%-1:GOTO23
70
2320 IF INKEY(-26) THEN NS%=S%-15:GOTO2
370
2330 IF INKEY(-122) THEN NS%=S%+15:GOTO
2370
2340 IF INKEY(-74) THEN PROCprint
2350 IF INKEY(-25) THEN PROCupdir
2360 IF newdir UNTIL TRUE:ENDPROC ELSE
GOTO2300
2370 IF NS%<0 AND page>0 THEN PROCscree
n("left"):NS%=FNnewns("left") ELSE IF NS
%<0 NS%=S%:PROCs
2380 IF NS%>44 AND page<pagemax THEN PR
OCscreen("right"):NS%=FNnewns("right") E
LSE IF NS%>44 OR (page=pagemax AND NS%>L
MAX%):NS%=S%:PROCs
2390 VDU 31,X%+1,Y%,156
2400 S%=NS%
2410 UNTIL FALSE
2420 ENDPROC
2430 :
2440 DEF PROCscreen(D$)
2450 IF D$="right" page=page+1 ELSE pag
e=page-1
2460 PROCdisplay(page*45)
2470 ENDPROC
2480 :
2490 DEF FNnewns(D$)
2500 IF D$="left" AND NS%=-1 THEN=44
2510 IF D$="left" =S%+30
2520 IF NS%>45 AND page=pagemax AND S%
-30>LMAX% THEN =LMAX%
2530 IF NS%>45 THEN =0
2540 =S%-30
2550 :
2560 DEF FNkeyclear
2570 LOCAL A%,X%,Y%
2580 A%=121:X%=0:Y%=0
2610 =((USR(osbyte)AND &FF00)=&FF00)
2620 :
2630 DEF PROCinit
2640 DIM code &200,data &1B00,F 12,osc
20,own 30,path$(30),S(30),P(30)
2650 red=129:green=130
2660 yellow=131:blue=132
2670 magenta=133:cyan=134
2680 white=135
2690 osbyte=&FFF4:osword=&FFF1
2700 osgpbpb=&FFD1:osascii=&FFE3
2710 osccli=&FFF7:osfind=&FFCE
2720 delay=0:p=0:first=TRUE
2730 up=FALSE
2740 sj%=Fnsj
2750 *FX 4,2
2760 VDU 23,1,0;0;0;0;
2770 ENDPROC
2780 :
2790 DEF PROCTitle
2800 PRINT TAB(4,0) CHR$141;CHR$fc;"Aco
rn User Network Cataloguer"
2810 PRINT TAB(4) CHR$141;CHR$fc;"Acorn
User Network Cataloguer"
2820 PRINT CHR$(barc+16);CHR$154;STRING
$(37,CHR$252)
2830 VDU 28,0,24,39,3

```

Continued ►

◀ Network Page listing 1 continued

```

2840 ENDPROC
2850 :
2860 DEF PROCprint
2870 entry=page*45+S%
2880 PROCaddr(entry)
2890 IF INSTR(ac$,"D")<>0 THEN PROCdir:
ENDPROC
2900 PROCclear
2910 IF FNnamestrip(entry)="...Private"
THEN PROCboxon:PROCnogo:GOTO2980
2920 PROCboxon
2930 PRINT CHR$h1c;"Load "CHR$fc;L$
2940 PRINT CHR$h1c;"Exec "CHR$fc;E$
2950 PRINT CHR$h1c;"Len "CHR$fc;S$
2960 PRINT CHR$h1c;"Access"CHR$fc;ac$
2970 PROCoptions
2980 PROCboxoff
2990 REPEAT
3000 IF INKEY(-49) AND ra% UNTILTRUE:PR
OCexit:PROCload:END
3010 IF INKEY(-50) AND ra% UNTILTRUE:PR
OCexit:PROCchain:END
3020 IF INKEY(-18) AND ra% UNTILTRUE:PR
OCexit:PROCstload:END
3030 IF INKEY(-19) AND ra% UNTILTRUE:PR
OCexit:PROCstrun:END
3040 IF INKEY(-58) OR INKEY(-42) OR INK
EY(-26) OR INKEY(-122) OR INKEY(-25) THE
N PROCclear:PROCinstructions:UNTILTRUE:d
elay=30:ENDPROC
3050 UNTIL FALSE
3060 :
3070 DEF PROCoptions
3080 VDU 28,18,24,39,20,12
3090 IF ra% THEN PROCaccok ELSE PROCnog
o
3100 ENDPROC
3110 :
3120 DEF PROCnogo
3130 PRINT 'CHR$txtc;"Insufficient Acces
s"
3140 PRINT CHR$txtc;"to load this file"
3150 VDU 28,0,24,39,19
3160 PRINT TAB(5,5) CHR$txtc;"Press Arr
ow Keys to continue";
3170 ENDPROC
3180 :
3190 DEF PROCaccok
3200 PRINT CHR$h1c;"1";CHR$fc;"LOAD "<
fname>""
3210 PRINT CHR$h1c;"2";CHR$fc;"CHAIN"<
fname>""
3220 PRINT CHR$h1c;"3";CHR$fc;"*LOAD <f
name>""
3230 PRINT CHR$h1c;"4";CHR$fc;"*RUN <f
name>""
3240 VDU 28,0,24,39,19
3250 PRINT TAB(0,5) CHR$txtc;"Press num
ber or Arrow keys to continue";
3260 ENDPROC
3270 :
3280 DEF PROCclear
3290 PROCboxon
3300 CLS
3310 PROCboxoff
3320 ENDPROC
3330 :
3340 DEF PROCload
3350 PROCinsert("LO."""+FNnamestrip(ent
ry)+""")
3360 ENDPROC
3370 :
3380 DEF PROCchain

```

Continued ►

YELLOW PAGES

NETWORK PAGE

◀ Network Page listing 1 continued

```

3390 PROCinsert("CH. """ + FNnamestrip(entry) + """)
3400 ENDPROC
3410 :
3420 DEF PROCstload
3430 PROCinsert("*LO. "+FNnamestrip(entry))
3440 ENDPROC
3450 :
3460 DEF PROCstrun
3470 PROCinsert("*RUN "+FNnamestrip(entry))
3480 ENDPROC
3490 :
3500 DEF PROCinsert(A$)
3510 LOCAL A%, X%, Y%, Z%
3520 CLS
3530 *FX 15
3540 A%=138: X%=0
3550 FOR Z%=1 TO LEN(A$)
3560 Y%=ASC MID$(A$, Z%, 1)
3570 IF Y%<127 THEN CALLosbyte
3580 NEXT
3590 *FX 138,0,13
3600 ENDPROC
3610 :
3620 DEF PROCexit
3630 IF p>0 THEN PROCod:PROCoscli("DIR
"+FNpathname)
3640 VDU 26,12,23,1,1;0;0;0;
3670 *FX 4
3680 REPEAT UNTIL FNkeyclear
3690 *FX 15
3700 ENDPROC
3710 :
3720 DEF PROCdir
3730 LOCAL A$
3740 PROCwait(0.4)
3750 A$=FNnamestrip(entry)
3760 S(p)=S%
3761 P(p)=page
3762 newdir=TRUE
3770 PROCdowndir(A$)
3780 p=p+1
3781 path$(p)=A$
3790 ENDPROC
3800 :
3810 DEF FNnamestrip(entry)
3820 LOCAL A$
3830 A$=MID$(FNname(entry),2)
3840 IF INSTR(A$, " ")<>0 THEN A$=LEFT$(A$,
INSTR(A$, " ")-1)
3850 =A$
3860 :
3870 DEF PROCoscli($osc)
3880 LOCAL X%, Y%
3890 X%=$osc MOD 256
3900 Y%=$osc DIV 256
3910 CALL oscli
3920 ENDPROC
3930 :
3940 DEF PROCupdir
3950 IF p=0 PROCs:ENDPROC
3960 PROCwait(0.4)
3961 p=p-1:p$=FNpathname
3970 IF NOT first THEN PROCod
3980 IF p>0 THEN PROCnd(p$) ELSE first=
TRUE
3990 newdir=TRUE
4000 up=TRUE
4010 ENDPROC
4020 :
4030 DEF FNpathname

```

Continued ►

◀ Network Page listing 1 continued

```

4040 LOCAL Z%, p$
4050 FOR Z%=1 TO p
4060 p$=p$+"." + path$(Z%)
4070 NEXT
4080 =MID$(p$, 2)
4090 :
4100 DEF PROCwait(T)
4110 LOCAL W
4120 W=TIME
4130 PROCclear
4140 PROCboxon
4150 PRINTCHR$fc "Please wait..."
4160 PROCboxoff
4170 REPEAT UNTIL TIME>W+T*100
4180 ENDPROC
4190 :
4200 DEF PROCnd(N$)
4210 LOCAL A%, X%, Y%
4220 first=FALSE
4230 X%=F MOD 256
4231 Y%=F DIV 256
4240 A%=&13
4241 !F=6
4242 CALL osword
4250 csave!=F
4260 F!2=FNopen(N$)
4270 IF F!2=0 THEN PROCexit:PRINT "Fatal
error: can't open "; N$:END
4280 ?F=7:CALLosword
4290 ENDPROC
4300 :
4310 DEF PROCod
4320 LOCAL A%, X%, Y%
4330 X%=F MOD 256
4340 Y%=F DIV 256
4349 A%=&13
4350 !F=6
4351 CALLosword
4360 CLOSE# F?2
4370 !F=csave
4371 ?F=7
4372 CALLosword
4380 first=TRUE
4390 ENDPROC
4400 :
4410 DEF FNopen($osc)
4420 LOCAL A%, X%, Y%
4430 X%=$osc MOD 256
4440 Y%=$osc DIV 256
4450 A%=&40
4460 =USR(osfind) AND &FF
4470 :
4480 DEF PROCdowndir(A$)
4490 IF first THEN PROCnd(A$) ELSE PROC
oscli("DIR "+A$)
4500 first=FALSE
4510 ENDPROC
4520 :
4530 DEF PROCinstructions
4540 PROCboxon
4550 PRINT CHR$txtc;"Filenames are colo
ured";CHR$fc;CHR$255;CHR$txtc;"directori
es";CHR$dc;CHR$255
4560 PRINT CHR$txtc;"Use arrow keys to
highlight entry, then";CHR$fc;"<return>"
;CHR$txtc;"shows load options or enters"
4570 PRINT CHR$txtc;"directory. ";CHR$fc
;"^";CHR$txtc;"enters parent directory."
;
4580 PROCboxoff
4590 ENDPROC
4600 :
4610 DEF PROCs

```

Continued ►

YELLOW PAGES

TOP OF THE LIST

◀ Network Page listing 1 continued

```

4620 SOUND 1,-12,100,2
4630 REPEAT UNTIL FNkeyclear
4640 ENDPROC
4650 :
4660 DEF PROCboxon
4670 VDU 28,0,24,39,19,12
4680 PRINT CHR$148;CHR$154;STRING$(37,C
HR$172)
4690 ENDPROC
4700 :
4710 DEF FNprivname
4720 LOCAL A%,X%,Y%
4730 X%=osc MOD 256
4740 Y%=osc DIV 256
4750 A%=6
4751 osc!1=F
4752 CALL osgpbp
4760 priv=? (F+2+F?1)
4762 ?(F+2+F?1)=13
4770 IF priv=0 THEN F?1=ownc ELSE F?1=p
ubc
4780 =$(F+1)
4790 :
4800 DEF FNowner(entry)
4810 IF NOT s% THEN =(priv=0)
4820 LOCAL A%,X%,Y%
4830 X%=own MOD 256
4840 Y%=own DIV 256

```

Continued ►

◀ Network Page listing 1 continued

```

4850 A%=&14
4860 !own=&12001200
4870 own!4=&5000000
4880 $(own+8)=FNnamestrip(entry)
4890 CALL osword
4900 =(own?19=0)
4910 :
4920 DEFFPROCboxoff
4930 VDU 28,0,18,39,3
4940 ENDPROC
4950 :
4960 DEF PROCerror
4970 ON ERROR OFF
4980 PROCexit
4990 IF ERR>>17 THEN REPORT:PRINT" at 1
ine ";ERL
5000 ENDPROC
5010 :
5020 DEF FNdata
5030 pt=P%
5040 RESTORE
5050 FOR n=pt TO pt+20 STEP 4
5060 READ !n
5070 NEXT
5080 num=pt+1:seek=num+1:p2=seek+1
5090 name=p2+10:pb=name+10
5100 =Z%
5110 :
5120 DATA 0,&30012,0,&20202004,&2020202
0,&202020

```

Top of the list

This month's extra is a new utility from Dr Mike Smith of Truro. Type in and run the listing - it saves a machine code file called 'Keep'. Now simply typing *KEEP will save your Basic program to disc. The filename is taken automatically from the first line of your program, which must be a REM with a single word as shown in the listing itself.

```

10 REM Keeper
20 REM by Dr M Smith
30 REM for B/B+/M/C/E
40 REM (C) Acorn User Oct
ober 1987
50 :
60 FOR pass=0 TO 3 STEP 3
70 P%=&900
80 LOPT pass
90 LDA &18
100 STA &81
110 LDA #&5
120 STA &80
130 LDX #&0
140 LDY #&FF
150 .loop
160 INY
170 LDA (&80),Y
180 CMP #&20
190 BEQ loop
200 STA buffer,X
210 INX
220 CMP #&0D
230 BNE loop

```

```

240 PHP
250 PHA:TXA:PHA:TYA:PHA
260 LDA #&07
270 JSR &FFE3
280 LDA #buffer MOD256
290 STA param
300 LDA #buffer DIV256
310 STA param+1
320 LDA #0
330 STA param+2
340 LDA &18
350 STA param+3
360 LDA #&23
370 STA param+6
380 LDA #&80
390 STA param+7
400 LDA #&00
410 STA param+10
420 LDA &18
430 STA param+11
440 LDY &12
450 INY
460 TYA
470 STA param+14
480 LDA &13
490 STA param+15
500 LDA #0
510 STA param+4
520 STA param+5
530 STA param+8
540 STA param+9
550 STA param+12
560 STA param+13
570 STA param+16
580 STA param+17
590 LDX #param MOD256
600 LDY #param DIV256
610 JSR &FFDD
620 LDX #0
630 .loop1
640 LDA mess1,X
650 BEQ next
660 JSR &FFE3
670 INX
680 JMP loop1
690 .next
700 LDX #0
710 .loop2
720 LDA buffer,X
730 CMP #&0D
740 BEQ next1
750 JSR &FFE3
760 INX
770 JMP loop2
780 .next1
790 LDX #0
800 .loop3
810 LDA mess2,X
820 BEQ next2
830 JSR &FFE3
840 INX
850 JMP loop3
860 .next2
870 PLA:TAY:PLA:TAX:PLA
880 PLP
890 RTS
900 .mess1
910 EQUUS "FILE "
920 EQUB 0
930 .mess2
940 EQUUS "SAVED"
950 EQUB &0D
960 EQUB 0
970 .param
980 J
990 P%=&P%+&12
1000 I
1010 .buffer
1020 J NEXT
1030 *SAVE KEEP 900 9BC 900

```

ACORN USER ORDER FORM

ACORN USER OFFERS

DISC SUBSCRIPTIONS

Yes! Please send me my free copy of *Viewchart* and start my disc subscription from the _____ issue

01 UK £69.00
02 EUROPE (Airmail) £76.00
02 OVERSEAS (Surface) £76.00
03 OVERSEAS (Airmail) £84.00

TOTAL VALUE £ _____

CASSETTE SUBSCRIPTIONS

Yes! Please start my cassette subscription from the _____ issue

01 UK £35.00
02 EUROPE (Airmail) £52.00
02 OVERSEAS (Surface) £52.00
03 OVERSEAS (Airmail) £62.00

TOTAL VALUE £ _____

MAGAZINE SUBSCRIPTIONS

Yes! Please start my subscription to Acorn User magazine from the _____ issue (UK Subscribers see page 94 before completing)

12 Issues 27 Issues
01 UK £17.50 £35.00
02 EUROPE £25.00 £50.00
03 MIDDLE EAST £30.00 £60.00
04 THE AMERICAS & AFRICA £35.00 £70.00
05 REST OF THE WORLD £40.00 £80.00

TOTAL VALUE £ _____

ACORN USER MONTHLY DISCS

1986	1987
<input type="checkbox"/> JAN 0204-6	<input type="checkbox"/> AUG 0211-9
<input type="checkbox"/> FEB 0205-4	<input type="checkbox"/> SEP 0212-7
<input type="checkbox"/> MAR 0206-2	<input type="checkbox"/> OCT 0213-5
<input type="checkbox"/> APR 0207-0	<input type="checkbox"/> NOV 0214-3
<input type="checkbox"/> MAY 0208-9	<input type="checkbox"/> DEC 0215-1
<input type="checkbox"/> JUN 0209-7	<input type="checkbox"/> MAY 0220-8
<input type="checkbox"/> JUL 0210-0	<input type="checkbox"/> JUN 0221-6
UK=£5.95	<input type="checkbox"/> JUL 0222-4
Europe=£6.95	<input type="checkbox"/> AUG 0223-2
Overseas=£7.95	<input type="checkbox"/> SEP 0224-0
	<input type="checkbox"/> OCT 0225-9

All AU discs are in DFS format for the 1770 and 8271 systems. Monthly discs are 5.25-inch (40-track with 80-track transfer program supplied)

TOTAL VALUE £ _____

ACORN USER MONTHLY CASSETTES

1985	1986	1987
<input type="checkbox"/> JAN 0409-X	<input type="checkbox"/> JAN 0421-9	<input type="checkbox"/> JAN 0433-2
<input type="checkbox"/> FEB 0410-3	<input type="checkbox"/> FEB 0422-7	<input type="checkbox"/> FEB 0434-0
<input type="checkbox"/> MAR 0411-1	<input type="checkbox"/> MAR 0423-5	<input type="checkbox"/> MAR 0435-9
<input type="checkbox"/> APR 0412-X	<input type="checkbox"/> APR 0424-3	<input type="checkbox"/> APR 0436-7
<input type="checkbox"/> MAY 0413-8	<input type="checkbox"/> MAY 0425-1	<input type="checkbox"/> MAY 0437-5
<input type="checkbox"/> JUN 0414-6	<input type="checkbox"/> JUN 0426-X	<input type="checkbox"/> JUN 0438-3
<input type="checkbox"/> JUL 0415-4	<input type="checkbox"/> JUL 0427-8	<input type="checkbox"/> JUL 0439-1
<input type="checkbox"/> AUG 0416-2	<input type="checkbox"/> AUG 0428-6	<input type="checkbox"/> AUG 0440-5
<input type="checkbox"/> SEP 0417-0	<input type="checkbox"/> SEP 0429-4	<input type="checkbox"/> SEP 0441-3
<input type="checkbox"/> OCT 0418-9	<input type="checkbox"/> OCT 0430-8	<input type="checkbox"/> OCT 0442-1
<input type="checkbox"/> NOV 0419-7	<input type="checkbox"/> NOV 0431-6	
<input type="checkbox"/> DEC 0420-0	<input type="checkbox"/> DEC 0432-4	

UK= £3.95
Europe= £4.95
Overseas= £5.95

Monthly cassettes are suitable for BBC micro and Electron users

TOTAL VALUE £ _____

ACORN USER MAGAZINE BACK ISSUES

1985	1986	1987
<input type="checkbox"/> JAN 0021-3	<input type="checkbox"/> JAN 0032-9	<input type="checkbox"/> JAN 0044-2
<input type="checkbox"/> MAR 0022-1	<input type="checkbox"/> FEB 0033-7	<input type="checkbox"/> MAR 0046-9
<input type="checkbox"/> APR 0023-X	<input type="checkbox"/> MAR 0034-5	<input type="checkbox"/> APR 0047-7
<input type="checkbox"/> MAY 0024-8	<input type="checkbox"/> APR 0035-3	<input type="checkbox"/> MAY 0048-5
<input type="checkbox"/> JUN 0025-6	<input type="checkbox"/> MAY 0036-1	<input type="checkbox"/> JUN 0049-3
<input type="checkbox"/> JUL 0026-4	<input type="checkbox"/> JUN 0037-X	<input type="checkbox"/> JUL 0050-7
<input type="checkbox"/> AUG 0027-2	<input type="checkbox"/> JUL 0038-8	<input type="checkbox"/> AUG 0051-5
<input type="checkbox"/> SEP 0028-0	<input type="checkbox"/> AUG 0039-6	<input type="checkbox"/> SEP 0052-3
<input type="checkbox"/> OCT 0029-9	<input type="checkbox"/> SEP 0040-X	<input type="checkbox"/> OCT 0053-1
<input type="checkbox"/> NOV 0030-2	<input type="checkbox"/> OCT 0041-8	
<input type="checkbox"/> DEC 0031-0	<input type="checkbox"/> NOV 0042-6	
	<input type="checkbox"/> DEC 0043-4	

UK= £1.75
Europe= £2.25
Overseas= £3.75

TOTAL VALUE £ _____

BINDERS

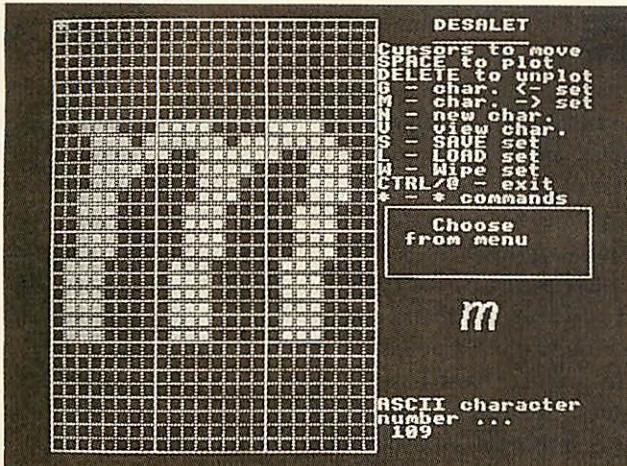
TOTAL VALUE £ _____

	UK	EUROPE	OVERSEAS
MAGAZINE BINDER	1201-7	<input type="checkbox"/> £4.95	<input type="checkbox"/> £7.95
DISC BINDER	1302-1	<input type="checkbox"/> £6.95	<input type="checkbox"/> £9.95
			<input type="checkbox"/> £14.95
			<input type="checkbox"/> £16.95

24 hour telephone service (0672) 40825

OFFERS

C A L L I G R A P H Y



A new dimension in letter designing

This is your chance to produce your own letterheads and posters to a professional standard, with the minimum of fuss and effort. *Acorn User's Calligraphy* disc has been compiled due to popular demand and contains all the programs needed to produce letter designs that will impress your friends and colleagues.

The *Desalet* program is a simple font creator which produces customised letters, to your personal design. It will save you from using repetitive data statements and error prone calculations. You can save your font set on disc and then call it up as needed. All previously saved sets can be modified or added to, and each set covers up to 94 characters.

Modical, a modification of the original *Calligraphy* program (September 1986 *Acorn User*) is also included on the disc. *Modical* allows the use of disc-based font sets created with *Desalet*. *Modical* also incorporates a modified file creation program, which permits files to be printed out immediately or saved for later printing.

An enhanced font ROM in the form of a sideways RAM image, is also on the disc. This allows you to design your own fonts for use on-screen. Any output to the printer will be in the new font – thus giving true WYSIWYG capabilities. There is a selection of new fonts to help you get started.

This superb disc comes in 5.25-inch, 40/80-track format and is great value at only £9.95.

L I S T I N G S

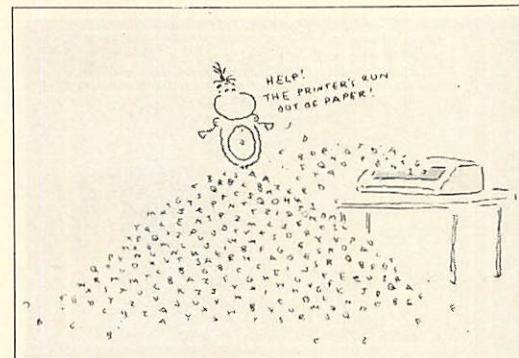


Easy learning with Education disc

BBC/B/ B+M/ C The *Acorn User* Education disc makes learning easy and enjoyable. The disc is packed with useful programs, including the *Eco-fax* database for Econets.

Graphics are a strong feature, and included on the disc are *Turtle Logo*, *Easyplot* and *Bulletin*, and you can then show off your creations with *Vufoil* and *Noticeboard* or make music with *Tunemaker*. Also included are an all-mode dumping routine for Epson compatibles and a teletext dumping routine for mode 7 dumping to Epson FX80 compatibles. All this for only £7.95.

D I S C S



Printer advice with Printer Help disc

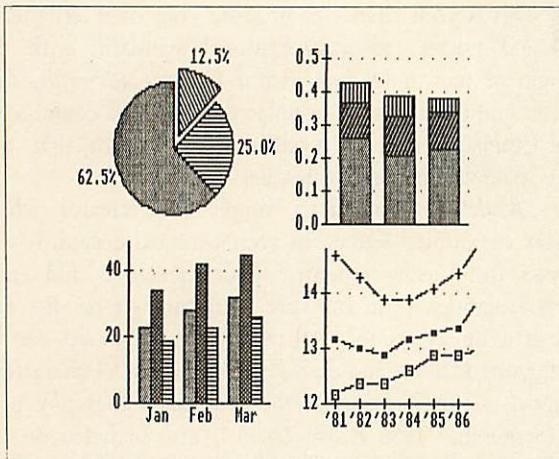
BBC/B/ B+M/ C Often printer manuals don't fully cover the Master and BBC micro – our disc will help you to understand your printer's facilities for just £7.95.

The 5.25-inch *Printer Help* disc illustrates various print type styles, use of *Wordwise* and *View*, screen images and printer care. There is an ASCII standard codes table and clear diagrams illustrating stages of printer use including advice on what to do if things go wrong.

For compatibility details write to Seran, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

OFFERS

CHART SOFTWARE



Improve your presentation with ViewChart

BBC/B/
B+/M/
C

Do you use your micro to prepare figures? Perhaps in *ViewSheet* or *ViewStore*? Do you make printed reports? This business graphics program from *Acorn User* contributor Peter Sandford is aimed at anyone who uses figures, and wishes to improve the quality of their work.

ViewChart takes your numeric data from a *ViewSheet* or *ViewStore* file, or manual input, and plots various chart formats to screen. In one plot you can produce between one and five piecharts, stacked bar charts up to 25 bars, grouped bar charts up to 24 bars and line graphs with up to five lines each of 40 plotted points.

In practice, most business presentation data such as sales figures, departmental breakdowns, cost analyses and so on can be presented in a form even the boss will understand!

You can even add extra text and graphics to the completed chart prior to saving or printing. A screen dump program is provided, for Epson and compatible printers, which is specifically designed to fit the width of an A4 page. Instructions are provided on interfacing to other printers. *ViewChart* works in screen mode 0, using full shading effects, so what you see on screen is what you get on paper, and includes some tips on final presentation of graphics in documents.

ViewChart is supplied on 40-track 5.25-inch disc and works on the BBC models B and B+ and Master 128.

And the price of this professional software? Just £12.95.

DISCS



Network utilities for better communication

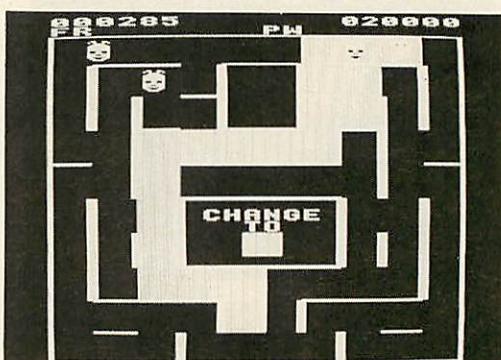
BBC/B/
B+/M/
C

The *Network Utilities* 80-track disc is the logical addition to your network, combining invaluable routines with a sophisticated yet easy-to-use noticeboard.

Included is *Netfax*, our own hybrid information system providing access to thousands of pages of information. Other special features are: a file locator and directory size finder; network manager utilities including a bridge compatible screen viewer and a 'notify all' facility.

Plus there are 150 *Netfax* pages covering instructions, help and indexes, all on a 5.25-inch disc for £19.95.

CASSETTES



Games galore in our compendium cassette

BBC/B/
B+/M/
C

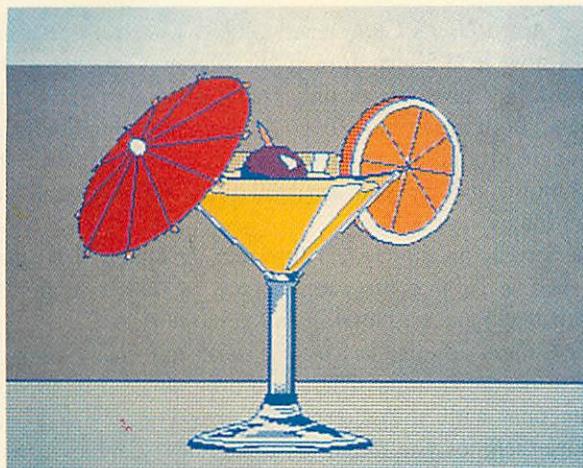
You can guide Shuggy around his garden; puzzle over *Puzzle*, and be 3-D amazed. Or destroy submarines with *Run Silent, Run Deep*. And for the really adventurous, go round the *Acorn User* office.

Best of all, try the truly different *Adventure* game written especially for the *Games Compendium* cassette by Rob Anderson. It's excellent value at £3.95.

You will also find David Acton's *Spectramania* and *Quadline* on this cassette: beat your micro, get four in a row. All are easily transferred to disc.

OFFERS

PROGRAM LISTINGS



Solve your problems with the monthly listings

Have you been having problems finding one thing among millions on your database? Joe Telford has, and his Jottings for October compare several different ways of sorting databases efficiently and ordering them for easy use. Using his program you can arrange all names and addresses alphabetically without spending hours doing it by hand.

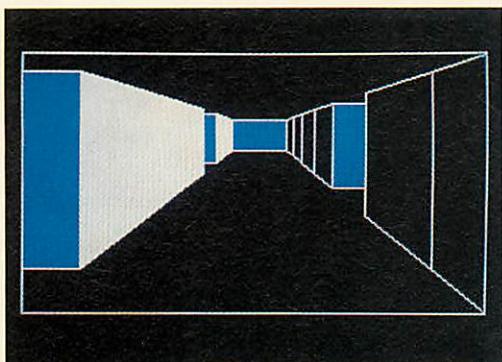
Based on the idea of writing programs to control the real world, our *Switch* program lets you practise programming a traffic light sequence. And you can use a modified version with an interface box to control real devices such as relays, buggies and robots.

Network users will be delighted by our 'cataloguer' program, which allows you to access your directories and files automatically, without the need for typing *commands.

Make certain that your text is printed as you want it with our printer driver generator for use with *View*. And also from Forum this month is a program that allows you to take the graphics from *Fleet Street Editor* and convert them for use with other graphics packages.

The monthly listings discs come in 40/80-track 5.25-inch format and are great value at only £5.95. All our monthly cassettes are for BBC and Electron users and contain a simple cassette to disc transfer program — a snip at £3.95. Don't forget all back issues of the cassettes and discs are still available too — see the order form on page 129.

L I S T I N G S

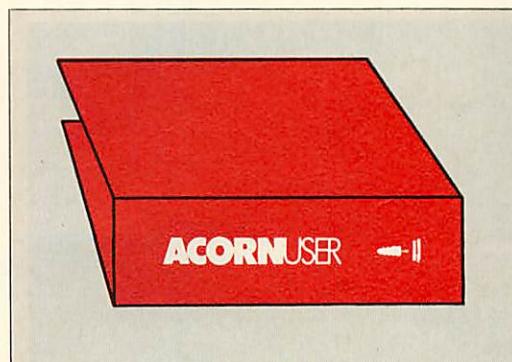


Monthly listings subscription special

Subscribing to the *Acorn User*'s monthly listings discs and cassettes will save you hours of typing and debugging the listings. For this issue only we are offering a subscription to our cassette listings for an unbeatable £35.00 — a saving of £10.00. Subscribers to the monthly listings discs will receive a free copy of *ViewChart* — worth £12.95 when they subscribe for the year.

The *Acorn User* monthly listings are great value, so be sure you receive the best programs, utilities and graphics and post your subscription today!

B I N D E R S



Vastly reduced prices for disc binders

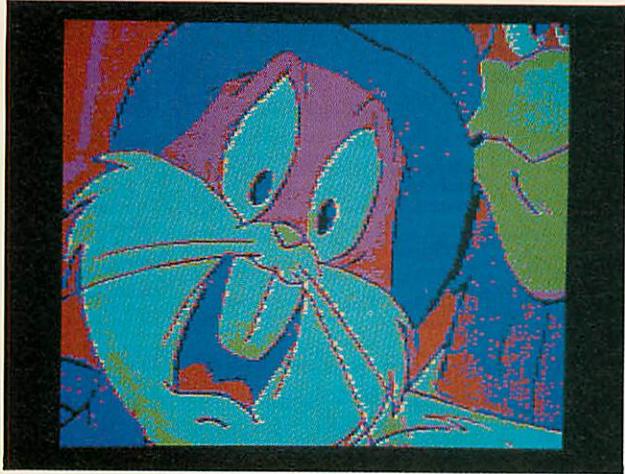
Our grey cloth disc binder is supplied with its own protective slip case and is filled with six transparent inserts, which will hold a year's supply of 5.25-inch monthly discs, and it is currently available at the special price of just £6.95.

An *Acorn User* magazine binder is the best way to keep your precious copies in pristine condition. Our smart red binder features a wide spine with the capacity to hold a whole year's issues. For only £4.95 your magazines can last a lifetime.

Acorn User order form on page 130 — 24 hour telephone service (0672) 40825

OFFERS

G A L L E R Y D I S C S



Gorgeous screens with our Gallery discs

BBC/B/
B+/M/
C

Acorn User's Gallery and Gallery Collection discs are now in 3.5-inch format for Master Compact users. Each disc is a giveaway at only £6.95, the same price for all formats. Both discs have over 20 brilliantly digitised and stunningly produced screens that will automatically scroll for your amusement, or you can load them all individually to have a longer look.

The screens on the *Gallery* disc include some old favourites, such as Thomas the Tank Engine, as well as some new ones that will amaze, tantalise and entertain you.

The *Gallery* disc also has *Super Painter* and *Pixel Editor*, so you can do the creating. These two programs can be used in conjunction with the screens we give you to alter and improve them, or you can create totally new graphics screens of your own.

The rich and the famous, or sometimes infamous, put in an appearance. Tony Hancock is on the *Gallery* disc, as is Max Headroom. On the *Gallery Collection* disc, *Spitting Image* and the *Dallas* crowd are in vivid colour in the company of Henry VIII, and everyone's favourite, Bugs Bunny.

All the screens on the *Gallery Collection* disc come in compressed form with a program to help you compress and expand your own screens, so saving valuable space.

Whether you choose 3.5-inch or 80-track or 40-track 5.25-inch format, you'll be getting great entertainment value.

D I S C S

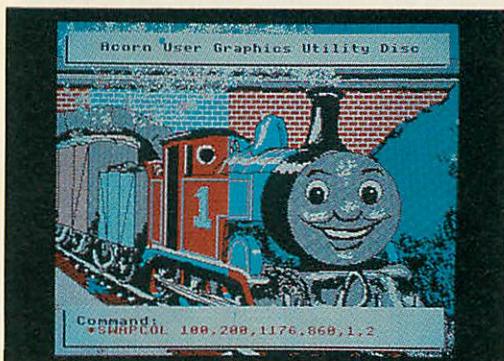


Disc for all sideways RAM users

**BBC/B/
B+/M/
C** The *Sideways RAM Utilities* disc includes: *RamPad* – your computer's answer to the pad and pen. *On-Screen Fonts* – a variety of print styles available in all graphics modes. * *HLP ROM* – add your own help text to call up when you're stuck. Standard ROM header for use when writing your own ROMs. * *RLOOK* to examine the contents of your ROMs and sideways RAM images.

There are many more utilities on this 40-track 5.25-inch disc with a transfer program for 80-track users, and it's competitively priced at £9.95.

D I S C S



Graphics utilities for your screens

**BBC/B/
B+/M/
C** The 40-track 5.25-inch *Graphics Utilities* disc, keenly priced at £7.95, features 16 routines to manipulate blocks of graphics: rotation and reflection, a screen compressor/expander, a colour flood-fill routine and three mode conversion commands.

With the Basic procedure library are multi-height, proportional and justified text and 'drop shadow' boxes. A teletext screen editor gives point plotting, line drawing, rubber banding and flood fill, along with all mode 7 control codes. All can be used in your own programs.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825

OFFERS

D U M P R O M S



Printer control with the UserDump ROM

BBC/B/
B+/M/
C/E

This pack includes the easy-to-fit *UserDump* ROM chip and a practical 22-page guide to the screen dump and printer control facilities offered – for just £19.95.

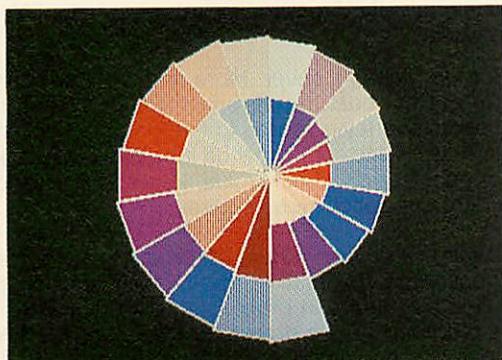
Once installed, *UserDump* will allow you to dump any screen image in any display mode by entering a single command – either as a line of your program or by typing in direct from the keyboard. A perfect dump can also be obtained while a machine code program is running.

UserDump features the following extra commands:
*WDUMP – dump of graphics window only in any mode;
*ZDUMP – a distortion-free dump of the mode 0 screen using plotter graphics; *TRANSIT – translate teletext screen into mode 1; *SHIFT <argument> – shift any area of memory;
*IBM – select IBM printer; *CP80 – select CP80 printer.

UserDump is compatible with the BBC micro (model B or B+) fitted with operating system 1.2. Any earlier version will cause problems. *UserDump* is fully compatible with the Acorn 6502 second processor. It works with any printer which has single density and double density bit image graphics, including all Epson (LX, RX and FX) printers, Star Gemini and Delta, SG, SD and SR, Canon and Kaga NLQ. Also usable are the Shinwa and other CP80 printers.

There are many more commands available with *UserDump*, and details are available from Seran, Redwood Publishing Ltd., 141-143 Drury Lane, London WC2B 5TF.

R O M S



Your favourite Acorn User routines

BBC/B/
B+/M/
C/E

Get *UserROM* for your favourite Acorn User routines. Plug in the ROM chip and 19 routines are instantly accessible via star commands, including colfill with 27 colourful fills; dotfill providing 23 new black and white shades; bad program recovery; variable lister; function key lister; a graphics compiler; a circle drawing routine and a sound compiler. There are many demonstration programs and a 22 page manual. All for £19.95.

Full details are available from Seran, Redwood Publishing Ltd., 141-143 Drury Lane, London WC2B 5TF.

R O M S

```
Assembler Extension ROM (AXR) 1.10
BITS (Use *BITS for help on OPT)
ASSM <src> <OPT 1> <<OPT 2>> <<dest>>
DSM <<address>> <<ROM>>
LUAR
STRIP <fsr> <<:>>
FX 104,0,0 to disable
Condition: On
```

Acorn User Assembler Extension ROM

BBC/B/
B+/M/
C/E

The AXR ROM, competitively priced at £19.95, is especially designed for use by machine code programmers. AXR adds a variety of options and commands to the Basic assembler, along with several new pseudo op codes, full Basic expression evaluation, and even the use of binary numbers. A disassembler is included in the software, and all 65C02 instructions can be used. AXR is compatible with Basic 1, 2 and Master.

Further details from Seran, Redwood Publishing Ltd., 141-143 Drury Lane, London WC2B 5TF.

Acorn User order form on page 129 – 24 hour telephone service (0672) 40825

1984

Innovation has been the by-word of Vine Micros since its inception, and in early '84 show-goers at the Micro User's Alexandra Palace Exhibition were the first to see the new company with their ADDCOMM ROM in action. Termed the 'Four in One' because of its wide coverage of Toolkit, Graphics, Logo Graphics and General commands, the ROM's forty statements were able to merge almost unseen into the BASIC language of the BBC and Electron computers. Later reviews and comparison tests with other better known "Toolkits" gave ADDCOMM top marks for ease of use, range of utilities and documentation. Later, the same ingenious method used to write ADDCOMM was to prove itself once again with the production of the MATRIX ROM - another success which has now become an important time-saving tool for many mathematicians and scientists.

1985

This was almost the year of the T.D.ROM, more and more BBC users were turning to disc, but the software houses were mostly offering programs on tape! Frustrated disc users were a ready market for anything that would ease the burden and boredom of loading from cassette. The 'T.D.' was to become the most effective transfer utility of its era! It was also the first system produced with the idea of safe-guarding the interests of Software Houses by having internal personal coding. But within months of the release of the T.D.ROM Vine Micros with almost indecent haste produced the REPLAY SYSTEM. Described in a leading monthly as 'a magical piece of equipment' and continuing the T.D.'s tradition of anti-piracy coding, the inventiveness of the Vine Micros programmer had produced a winner. Personal back-up of programs was easier and more efficient than ever before. Spin-offs from the system included the ability to save a partly played game to disc whenever desired, thus making it possible to reach the otherwise unattainable finish of a program. Screens could also be saved to disc for printing-out, and lifesaving 'cheats', or 'improvements' to the pure of heart, could be entered into program data through REPLAY. This was the games player's dream come true!

1986

The Master computer was announced by Acorn. Necessity is known as the fore-runner of invention, and the first offering from Vine for this new micro was a simple switch to write-protect the RAM banks. But it was soon obvious that Master owners would not be content for very long with Acorn's choice of built-in software and a means of substituting old favourites became a prime necessity. This brought a new word to the attention of Master users, "overlaid" took on another meaning when ROMBOARD '3' showed its paces.

1986 also produced a bonus for the BBC 'B+'; users of this micro, disheartened by the refusal of the machine to run many BBC 'B' programs from tape were offered the 'B+' to B conversion kit. The gap between the two machines being bridged by the simple idea of fitting a board which could hold both of the essential operating systems and allow switching between them.

1987

The ROMBOARD '3' was now used to provide a spring-board for the long awaited MASTER REPLAY. The unchallenged champion of the BBC era had been re-vamped and re-written to provide the most sophisticated and most exciting piece of firmware possible for tape to disc transfer. After months of development and testing of the hardware design and hours of solid programming by its originator, the MASTER REPLAY could now be used through the ROMBOARD '3' or as a completely self-contained unit. But another goody was in store for Master owners who had upgraded from the BBC machine - the MASTER to 'B' conversion seemed impossible - but Vine's miracle department had got it taped! Yes, those old BBC cassettes could be dusted off and used again.

Summer, 1987 and there were still gaps to be filled under the Master's cover. More and more programs on ROM were a temptation to Master owners wanting to get the best out of, and the most into, their computers, ROMBOARD '4' provided the solution; once again overlaying came to the fore, but this time in the direction of the RAM banks and cartridge slots, four new ROMs could now be introduced and links adjusted to get the desired formation. An added bonus for both ROMBOARD '3' and '4' was the addition of switches to save 'under the bonnet' fiddling when a different option was required.

NOW

Having impressed our customers for the past four years with our range of products with their compatibility and forethought of future needs; and our easy to follow step-by-step installation instructions; and our helpful advice by letter or 'phone; and our speed in processing order - (quote "I only ordered late yesterday afternoon, and it arrived this morning!") - we do realise that there are a lot of readers out there who may not have seen our previous information-packed advertisements. So for anyone interested who would like leaflets on any of the above mentioned products please 'phone or write to:-

**VINE MICROS, MARSHBOROUGH,
Nr. SANDWICH, KENT, CT13 0PG.
Tel: 0304 812276.**

Products for Acorn Master

MASTER REPLAY (S/Contained)	£41.95
MASTER REPLAY (Add-on)	£36.95
MASTER/B' conversion	£14.95
ROMBOARD '3'	£19.95
Switches for above	per set of 3 £4.00
ROMBOARD '4'	£29.95
Switches for above	per pair £5.00
WRITE-PROTECT SWITCH	£8.95

Products for BBC 'B' and 'B+'

REPLAY (State which disc interface is used)	£35.00
B+ to B conversion (includes O.S. 1.20)	£25.95
B+ to B conversion (Board only)	£15.95
ADDCOMM (Also Electron)	£28.00
MATRIX ROM (Also Electron) (25% off 2 and over)	£41.40



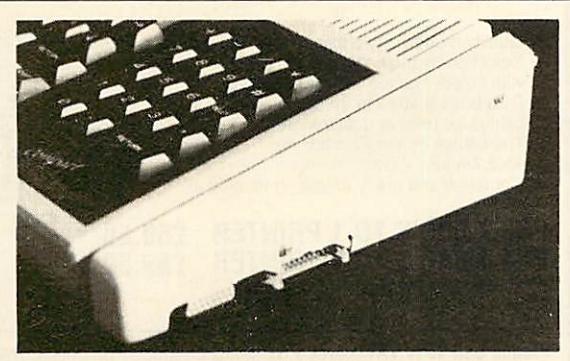
Above prices include VAT, also postage when supplied direct.



MASTER THE COMPACT WITH THE COMPACT COMPANION

YOU COULD SAVE AS MUCH AS £200 ON THE
PURCHASE OF AN EQUIVALENT MASTER 128 COLOUR SYSTEM!

THE COMPREHENSIVE INTERFACE
TO UPGRADE THE MASTER COMPACT



If you need more from your ACORN COMPACT COMPUTER or you are a decision maker considering the purchase of the ACORN MASTER 128 for your organisation, then look at the ECONOMIC advantages of using the ACORN COMPACT COMPUTER with the COMPACT COMPANION.

The COMPANION INTERFACE provides a COMPACT COMPUTER with most of the extra facilities normally found on the MASTER 128

- ★ User Port
- ★ Analogue (Joystick) Port
- ★ MH2 Bus
- ★ ACORN 1770 DFS in ROM
- ★ All connections Standard MASTER 128
- ★ Full user control of the Interface Software

The interface bolts directly onto the end of the keyboard and simply adds one inch to the keyboard length. Fitting takes two minutes.

PRICE £39.95 inc. VAT
Educational discounts available
Dealer enquiries welcome.

**MERTEC COMPUTER PRODUCTS,
35/36 SINGLETON STREET,
SWANSEA SA1 3QN.
Tel: (0792) 467980.**

Danté's

INFERNO

*a graphic adventure
for the BBC computer*

2 x 40 track reversible 5.25" discs £14.95 incl. p&p
1 x 80 track double sided 3.5" disc £19.95 and VAT

to Vanadis Software, 37 Jeune St., Oxford OX4 1BN

QUESTION: WHAT SEARCHES 150 MAGAZINES IN UNDER 300 SECONDS?

ANSWER: THE MAGAZINE BIBLIOGRAPHY DATABASE

It contains details of nearly 21,000 references and includes every issue of ACORN USER, MICRO USER, A&B COMPUTING, EDUCATIONAL COMPUTING and BEEBUG e.g. articles, listings, reviews, hints, tips, corrections, news items and readers' letters - everything remotely related to the BBC Micro!

Choose any subject or keyword; the fast two-string search option (0.39 seconds per 10K) provides the title, description, source, page number and date of all occasions when it has been written about, on screen with global or selective hard copy.

Magazine reviewers have called it "the ultimate index", "a valuable asset that has tremendous possibilities", "outstanding", "unique" and a "remarkable product". B/B+/Master compatible.

MAGAZINE BIBLIOGRAPHY 1-16	(Dec '81-April '87)	1.415K	£60
ACORN USER 1-4	(July '82-Dec '86)	394K	£20
MICRO USER 1-4	(March '83-Aug '87)	350K	£20
A & B COMPUTING 1-3	(May '83-May '87)	282K	£15

Please specify number of tracks, sides and drives
when ordering, or send large S.A.E.

for full details. All prices inclusive of p+p + VAT.

Mc Hugh Enterprise, 43 Hookstone Oval, Harrogate HG2 8QE.

BEST QUALITY UNBRANDED DISKS

Supplied complete with white protect, labels, sleeves and hub rings
(Boxed in tens price per box of 10 discs)

	1+	3+	5
5½" DS/DD 40T	£5.50	£16.00	£26.50
DS/DD 80T	6.00	17.50	29.00
3½" SS/DD 40T	12.50	36.00	
DS/DD 80T	16.00	46.50	
3½" SS/DD 40T	12.50	36.00	60.00
DS/DD 80T	16.00	46.50	77.00

DISC DRIVES (Mitsubishi Disc Drives by UFD 2 yrs guarantee)
MD 400A Single without PSU £125.00 MD 400B Single without PSU £135.00

CHIPS

27128-25ons 21vpp	£4.00	65C02 4MHz	£16.00
27512-25ons	£10.00	8271 CPU FDC	£37.50

MAIL ORDER ONLY

All prices inclusive of P&P and VAT

DIAL - A - DISK
258 Wilbraham Road
Manchester M16 8QL
Tel: 061-881 7712



COMPUTER SERVICING

(established since 1979)



WE REPAIR - ON THE PREMISES - QUICK TURNAROUND

- ★ AMSTRAD PC AND OPUS PC
- ★ BBC & ELECTRON (APPROVED SERVICE CENTRE)
- ★ COMMODORE & SPECTRUM
- ★ DISC DRIVES, PRINTERS, MONITORS
- ★ HARDWARE HIRE - MINIMUM 10 DAYS

MAIL ORDERS by phone Access and Visa Accepted

A Range of Hardware, Software, Joysticks, Leads, Interfaces
Chips etc, and Computer Paper always in stock

CROYDON COMPUTER CENTRE

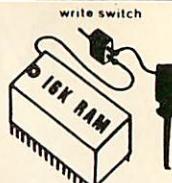
29 BRIGSTOCK ROAD, THORNTON HEATH,
SURREY CR4 7JJ. Tel 01-683 2646

THIS NOTICE WORTH £5

AGAINST ANY PURCHASE OF HARDWARE OR SOFTWARE OVER £50

AAU

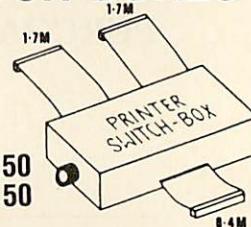
RAM MODULES TAPE, DISC & NETWORK systems



- ★ Plugs into any ROM socket, no soldering
- ★ 32k occupies two sockets (2x16k banks)
- ★ Ideal for ROM boards. Single Socket 32k also available.
- ★ ATPL versions available - adds extra 16/32k
- ★ Software includes full Load/Save/List ROMS
15k Printer buffer, Network easy-loader, view drive generator. Full documentation.

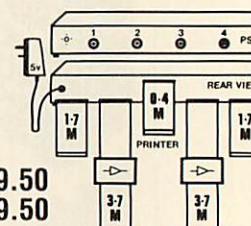
16K £16.95
32K £25.95

PRINTER SWITCH BOXES



- ★ Complete with all cables & connectors
- ★ Robust plastic case, 100x50x20mm
- ★ Selection by colour indicator button
- ★ Printed circuit board construction
- ★ Ready to use just plug in

PS1 BBC'S TO 1 PRINTER £31.50
PS2 BBC TO 2 PRINTERS £31.50



- ★ Quality modern style plastic case in beige/brown, size 205x145x40mm
- ★ Selection by push switches fitted with colour change indicator buttons
- ★ Data buffers fitted to the 3.7m cables for reliable data transfer. The cables on the PS3 box are 1x3.7m+2x1.7m
- ★ Complete and ready to use - just plug in

PS3 BBC'S TO 1 PRINTER £59.50
PS4 4 BBC'S TO 1 PRINTER £69.50

(Please add £2 for each BBC Compact)

Please add 15% VAT Free P&P Send Cheques/PO/Official Orders to:
TERRELL ELECTRONICS, 7B Essex Gardens,
Hornchurch, Essex RM11 3EH. Tel: (04024) 71426

Prices Exclude VAT EDUCATIONAL DISCOUNTS

PERFORM IN-CIRCUIT EMULATION CHEAPER WITH THE NEW ICE-KING. SINGLE STEP OR BREAK POINT PROGRAMS - TEST RESULTS IMMEDIATELY!

PLUS STAND-ALONE COMPUTER AND A FULL RANGE OF INTERFACE BOARDS IDEAL FOR SMALL SYSTEM DEVELOPMENT, EDUCATION, TRAINING, ROBOTICISTS, ETC.

COMPLETE SYSTEM £250 + VAT

S.A.E. FOR FURTHER DETAILS:

ICE-KING, LANCASTER
CONSULTANTS,
PO BOX 65,
LANCASTER
LA1 1PG

ICE-KING
THE IN-CIRCUIT EMULATOR
TURN YOUR BBC B INTO A
COMPLETE DEVELOPMENT
SYSTEM FOR
6502-BASED
TARGET
COMPUTERS

MICRO

FIX

FAST REPAIRS FOR THE
BBC MICRO BY
THE ACORN APPROVED
SERVICE CENTRE

191 FRESTON ROAD, LONDON W10 6TH

- Repair centre for BBC, B, B+ Electron, disc drives etc.
- We have been Acorn service specialists for 3 years and are justifiably recognised as experts in this field.
- BBC micro repairs: average cost £15-£20.
- Complete disc drive calibration: £15/drive
- Upgrades: Disc - £65 inc. installation.
Econet - £65 inc. installation.
- Other upgrades carried out as required.
- All repairs fully guaranteed.
- Insured return carriage if required.
- Extended warranties available on most equipment.
- Low prices for Mitsubishi disc drives and Acorn peripherals.
- Acorn authorised Econet support centre. Expert installations and trouble-shooting.
- Express service by prior arrangement.
- Opening hours: Normally Mon, Tue 9.30am-6pm, Wed-Fri 10am-4.30, but phone first.

RING 01-968 9214 AND ASK FOR REG ELWOOD

MB2A



C O M P U T I N G
BUSINESS SYSTEMS • HARDWARE
SOFTWARE • VIDEO SYSTEMS
MEDIA SUPPLIES
OFFICIAL DOMESDAY DEALER

Acorn
 The choice of experience
ACORN APPROVED DEALER

Phone 0602 787923

Disc Drives

Misc

Tally MT 85 80col 180cps 45cps NLQ	£344.00 (a)
Epson LX86 80col/120cps + 16cps NLQ	£229.00 (a)
Juki 5510 80col/180cps + 30cps NLQ	£249.00 (a)
Juki 5510 Colour Upgrade Kit	£94.00 (c)
Canon PW 1080A 80col/150cps + 27cps NLQ	£229.00 (a)
Citizen 120 D 80col/120cps + 25cps NLQ	£164.00 (a)

3.5"

3M 35SS DS/DD 48TPI	£11.00 (d)
3M 745 DS/DD 48TPI	£13.00 (d)
3M 747 DS/DD 96TPI	£17.00 (d)
Add £1 for plastic library case	
B & S Label 96TPI in see through LIB. Case DS/DD	£13.00 (d)
Disc Cleaning Kit	£9.00 (d)

Lockable Anti-Static 5.25" Storage Cases

50 Disc Capacity	£8.00 (d)
100 Disc Capacity	£10.00 (d)

Monitors

All Monitors include BBC Lead

Phillips Range of high resolution Mono Monitors with Audio Input Green Amber or Paper White.

BM 7502 (Green)	£69.00 (a)
BM 7522 (Amber)	£74.00 (a)
BM7442 (Paper White)	£77.00 (a)

Phillips Colour Monitor RGB, Composite Video, Audio in Linear RGB Green Screen Switchable

BBC/IBM Compatible CM8833

Microvitec

1431 (Metal or Plastic Case please specify) Std. Res.	£179.00 (a)
1451 (Metal or Plastic Case please specify) Med. Res.	£224.00 (a)
1441 (Metal or Plastic Case please specify) High Res.	£375.00 (a)
1431 AP Metal Case RGB and CV/Audio Std. Res.	£209.00 (a)
1451 AP Metal Case only RGB and CV Audio Med. Res.	£259.00 (a)
TILT and SWIVEL Stands for Plastic Case Only	£19.00 (d)

Plinths

BBC B Single	£11.00 (c)
BBC Master Single	£12.00 (c)
BBC Master with Shelf	£22.00 (b)

UK Customers: please add 15% VAT to all prices (including carriage).

Government and educational establishments official orders welcomed. When ordering please enclose a cheque or postal order for the appropriate amount. UK Carriage Rates (a) £8.50 - courier insured delivery (b) £3.50 (c) £2.50 (d) £1.50 (e) £1.00. All prices are correct at time of going to press. All offers are subject to availability, all prices are subject to change without prior notification and are available on request. Current price list is available on request.

Goods normally despatched on receipt of order.

B & S COMPUTING (NOTT'M) LTD
THE LENTON BUSINESS CENTRE
LENTON BOULEVARD
NOTTINGHAM NG7 2BY
PHONE: 0602 787923

Computers and Upgrades

Trade in your old Model B against a new
Master 128 or Master Compact.

Master 128	£369.00 (a)
Master E.T. (Econet Filing System only)	£320.00 (a)
Master Turbo Upgrade	£99.00 (c)
Master 512 Upgrade	£189.00 (c)
Master 128 Eprom Cartridge	£11.00 (c)
Master 128 Dust Cover	£4.50 (e)

Special Prices on upgrades if ordered with Master 128. Phone for details.

BBC Master Compact from Archimedes from	£349.00 (a)
	£799.00

All Compacts with Package Offers of Software etc. a value of £35 to £50 software etc. to your choice.

Compact RS 232 Interface	£26.00 (c)
Compact TV Modulator	£26.00 (e)
Compact Second Disc Drive	£99.00 (a)
Compact 5.25" Second Drive Cable	£11.00 (e)
1770 Disc Interface	£41.00 (d)
ADFS ROM (B+ or B with 1770)	£25.00 (e)
B+64 64K Upgrade	£30.00 (d)

Printers (Dot Matrix)

Tally MT 85 80col 180cps 45cps NLQ	£344.00 (a)
Epson LX86 80col/120cps + 16cps NLQ	£229.00 (a)
Juki 5510 80col/180cps + 30cps NLQ	£249.00 (a)
Juki 5510 Colour Upgrade Kit	£94.00 (c)
Canon PW 1080A 80col/150cps + 27cps NLQ	£229.00 (a)
Citizen 120 D 80col/120cps + 25cps NLQ	£164.00 (a)

Printers (Daisy Wheel)

Juki 6000 80col 12cps	£182.00 (a)
Juki 6100 110col 20cps	£280.00 (a)
Juki 6300 132col 40cps	£774.00 (a)
Citizen Premier 35 132col 35cps	£554.00 (a)

Printers (Laser)

Canon LPBAI (8 pages/min)	£1599.00 (a)
New Citizen Laser Overture 110 10 pages/min 250 Sheet cassette dual interface.	£1650.00 (a)

All printers include Free BBC cable or plus £5.00 for IBM lead.

AMX Mouse and Software

AMX Mouse + Super Art	£66.00 (d)
AMX Pagemaker	£37.00 (d)

SPECIAL OFFERS

Printers - Dot Matrix

MP 135 80col/135cps + 27cps NLQ	£135.00 (a)
MP 165 80col/165cps + 38cps NLQ	£166.00 (a)
MP 200 80col/200cps + 40cps NLQ	£249.00 (a)
MP 201 136col/200cps + 40cps NLQ	£274.00 (a)

Printers - Daisy Wheel

MP 26 - 26cps Diablo 630 compatible	£234.00 (a)
MP 40 - 40 cps Diablo 630 compatible	£319.00 (a)

Gaken 18cps

£189.00

Disc Drives

Direct Drives all with full 3 yr. Warranty

0241 40/80T DS 400K	£99.00 (a)
0243 Dual 40/80T 800K (Horizontal)	£194.00 (a)
0246 40/80T DS 400K Inc PSU	£114.00 (a)
0248 Dual 40/80T 800K (Horizontal) Inc PSU	£214.00 (a)
0249 As 0248 in Master Bridge/Monitor Plinth	£229.00 (a)
0250 As 0248 with 1 x 3.5" & 1 x 5.25"	£239.00 (a)

UDF Drives (2 yr. Warranty)

MD 802 C Dual 40/80T DS 800K (Vertical)	£214.00 (a)
MD 802 E Dual 40/80T DS 800K Inc PSU	£244.00 (a)
MD 802 DM As above in Master Bridge/Monitor Plinth	£284.00 (a)

Winchester Drives

20 mb incl. PSU and ADFS	£549.00 (a)
40 mb incl. PSU and ADFS	£869.00 (a)

ROM Boards

ATPL Sideways (state B or B+)	£36.00 (d)
Viglen ROM System (B Series)	£11.25 (d)
Viglen ROM System (Master 128)	£12.00 (d)
Viglen ROM System Compact	£12.00 (d)
Viglen Spare Cartridges	£1.69 (e)

Printer Ribbons and Accessories

Epson 8302 LX 86 Tractor Unit	£19.00 (c)
Epson 8338 LX 86 SSF	£48.00 (b)
Epson LX 86 (Compat)	£2.89 (e)
Epson MX 80/RX 80/FX 80/85 (Compat)	£2.50 (e)
Juki 5510/Citizen MSP 20 (Compat)	£2.50 (e)
Citizen 120D/LSP10	£3.75 (e)
Taxan 810/Canon (Compat)	£3.74 (e)
Juki 6100 Multistrike	£2.30 (e)
Tally MT85 Fabric	£5.00 (e)
Tally MT86 Carbon	£7.00 (e)
Printer lead 1.5m B/B+/M128/ELK + 1	£6.00 (e)
Printer lead 1.5m Compact	£8.00 (e)
Printer lead 2m IBM or Compatible	£10.00 (d)
80col Printer Stand	£11.00 (c)
Universal Printer Stand	£15.00 (d)
Printer Switch Box 2 Way "T" Switch	£39.00 (c)

Modems

All Modems inc BBC Lead

Miracle WS2000	£95.00 (c)
Miracle WS4000 Hayes Compat	£144.00 (a)
Pace Nightingale + Comstar II	£94.00 (c)
Nightingale Auto Dial Auto Answer Board + SW	£52.00 (d)
Pace Comstar II ROM	£28.00 (e)

NB BABT APPROVAL ON MODEMS ONLY

50ft. Telephone Extn. Cable on Wind up Reel

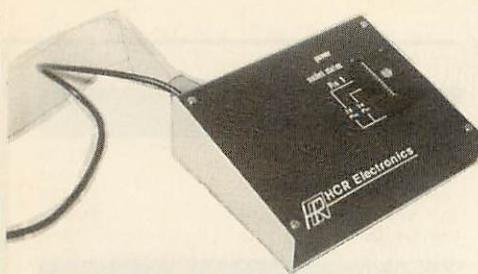
£9.50 (d)

Software

Acorn Soft	
Micro Prolog	£50.00 (d)
Logo	£44.00 (d)
Forth	£32.00 (e)
Lisp	£33.00 (e)
View 2.1	£37.00 (d)
Viewsheet	£37.00 (d)
View Spell (80T only)	£29.00 (d)
View Index	£10.00 (e)
View Printer Driver Gen. Tape	£7.00 (e)
	Disc

Computer Concepts	
Interword	£39.00 (d)
Interchart	£26.00 (d)
	Interbase
	£35.00 (d)

The Newly Released Spellmaster </td
--



128K EPROM PROGRAMMER

Again a quality-built product, cased in steel two tone case and comes complete with software in ROM, ZIF socket and all cables. This is the follower of the well proven 64K Micron Plus EPROM Programmer.

THE SPECIFICATION

- ★ Programme 2716, 2732, 2764, 27128, 27256, 2532, 2564, 27512, 27513, 2516, 27011, 2732A, 2764 etc.
- ★ Programs all EPROMS up to 27512 (64K) in a single pass (master only).
- ★ Programs all EPROMS up to 32K in a single pass (BBC B).
- ★ Fully buffered
- ★ Software selectable programming voltage 12.5/12/25 volt
- ★ Normal or high speed algorithmic method of programming (software selectable).
- ★ Continuous display of option selected.
- ★ ZIF socket powered down when not in operation.
- ★ Mains derived self contained power supply.
- ★ VCC is raised to 6V during programming in line with manufacturers' recommendations.

SOFTWARE ON ROM INCLUDES

- ★ Fully menu driven
- ★ Automatic verification on completion of programming and fault listing.
- ★ Built in full screen memory editor (buffer is 32K long).
- ★ Software allows blank check or EPROM and automatically lists faults.
- ★ Will copy EPROMS to buffer or file.
- ★ Will generate checksum.
- ★ BBC format ROM images may be created using a number of images of basic or machine code programs.
- ★ More than one image can be stored on one ROM.

This programmer has been designed and manufactured by H.C.R. Electronics to industry standard. Our engineers are on hand for queries relating to this product.

Price only £68.00 + £10.20 VAT + £3.00 P&P.

Orders to:

H.C.R. ELECTRONICS,
H.C.R. House, Bakers Lane,
Ingatestone, Essex CM4 0BZ.
Telephone (0277) 355407/8.



SQUIRRELSOFT PRESENT

The new 'CARE' range of programs:
For the Electron, BBC-B & B+, Compact, Master and Archimedes



INVESTMENT CARE PLUS - £19.95

Keeps track of all UNIT TRUSTS, SHARES etc. Produces displays & printouts of Capital Gains, Dividends, Current Holdings valuations showing Quantities, Bid/Offer prices, Values, Gains/Losses, APR%, HiVal %, etc.

This new version has improved handling characteristics and a 3D BAR CHART program with a disc search procedure to collect past data.

CASH CARE - £11.95

Bank account AND Savings account. Full Analysis - 60 categories. Budget Forecasts. 3-D Bar Charts. Password Protection. Easy storage of data. Printouts of all accounts and Bar Charts.

BUILDING SOCIETY CARE - £9.95

Checks the complex interest calculations involved on a day to day basis. Shows interest earned to date. Spreadsheet display. Easy storage of data. Printout of account to date.

VAT CARE - £14.95

225 Sales AND 225 Purchases each month (BBC). Three month period. ALERT warning if VAT 2% or more incorrect. Easy storage of data. Printout with month & 3 monthly totals.

The CARES DISK - £29.95 - comprising all four CAREs utilities.

TV DIRECTOR:-

Now popular in schools this program enables you to make your own video without cameras etc. on VHS or Betamax using this suite of purpose built software:-

'Picture maker' - 'Gallery' - 'Program review' 'Gallery' includes one TX and 8 P/V monitors, A&B bank vision mixer to provide cuts, fades, & dissolves, opening & closing credits. Sample picture datafile provided to get you going - choose your own soundtrack & record the result on to any suitable video recorder - £14.95.

PLUS our range of QUALITY games:

Supergolf - £7.50 Trafalgar - £8.00 Polar Perils - £7.95 Bunfun - £6.50

THE GAMES DISK £14.95 COMPILATION OF GAMES PROGRAMMES

PLEASE FORWARD ME ON CASSETTE/DISC

40TK 80TK 3.5" 5 1/4"

I HAVE A BBC-B MASTER COMPACT ELECTRON ARCHIMEDES

ENCLOSED £ OR DEBIT MY ACCESS CARD NO.

NAME

ADDRESS

Dept AU10, 4 Bindloss Avenue, Eccles, Manchester M30 0DU
Please phone 061-789 4120 for further information

VERSATILE CAD/CAM For the BBC Micro

A sophisticated, menu driven, user friendly CAD/CAM package with many facilities for very accurate drawing construction and data extraction for Numeric Control (NC) post processing. As used in Education and Industry.

CAD System (EDUCAD) - £80 (ex. vat)

- * geometric/schematic drawings
- * zoom, scale and units control
- * text/symbols, any size and angle
- * mirror and duplicate
- * generalised x-y plotter output
- * area properties
- * construction/modification
- * text/symbol font editor
- * intersects and tangents
- * rubber banding
- graphics screen dump
- * revision/material info. editor

CAM System (EDUCNC) - £35 (ex. vat)

- * part geometry from EDUCAD
- * tool path animation
- * part profile definition
- * generalised NC post processor

Econet Network versions available.

Both packages have explicit input prompts and error messages. This together with over 80 pages of online HELP data makes these systems easy to use and easy to learn - an ideal way of introducing this new technology.

TO ORDER simply specify disk format requirements or to obtain further details contact:

EDUSOFT,
Lodge Hill, Sevens Road,
Cannock Wood, Rugeley,
Staffs WS15 4RX

AA270

Succeed with LCL Educational Software

COMPLETE SELF-TUITION GCSE/GCE COURSES (age 4 - GCSE - A)



THE BEST awarded the highest ever marks for ed. soft. in recent mag. review.
Hons. graduate/teacher authors.
World leaders (distributors in 24 countries).

FOR YOU for beginners (from ages 4 to adult), exam candidates or teachers with any BBC Micro (B, B+, Master or Compact or Electron).

NOW immediate dispatch

Each course consists of 24 programs on up to 105 topics held on 2 - 4 discs/tapes and usually with 2 books and a voice tape and costs only £24.

£5 off total for 2 courses, £10 off for 3, £17 off for all 4

PRIMARY MATHS COURSE

All animated, colour graphics (4 discs)

MICRO FRENCH

With real speech & graphics adventure game

MICRO MATHS

Best seller, highly acclaimed

MICRO ENGLISH

Eng. Language or EFL with real speech

MEGA MATHS

A-level course with all Calculus by graphics

LCL (Dept A) Melody House, 13 Deanfield Road, Henley, Oxon RG9 1UG.



or ring 0491 579345 (10am-10pm)



NAME ADDRESS

TITLE COMPUTER 40/80 Disc/Tape/Compact

EDUCATION

NEWS

Back to school special edition

This month's edition of *Acorn User* is a back-to-school special. As well as these education news pages, several of our feature articles are of relevance to school computer users. Articles of particular interest to educationalists include:

Forecasts by Fax page 88
Gain Control page 95
Better by Design page 103
The Sword in the Software page 146
Your Own Viewdata System page 149
Software Review page 151
Network Page page 153

Teaching with a cheese sandwich

Home economics teachers will find a wealth of materials in Academic Software's range.

In the home economics area, and perhaps of use in biology, *Digestion* follows the route of a cheese sandwich through the digestive tract, studying the enzymes that break down the food and the nutrients that come from it. In addition there is the *Compleat Meal Planner* (£31.95) which provides for studying the practicalities of menu planning and contains much nutritional data.

Kitchen Planner in 3D (£21.95) has been recently modified and updated. This package allows the design of kitchen plans which take into account ergonomic considerations. Simple costings are also linked to the planning element.

Speaking out for the disabled

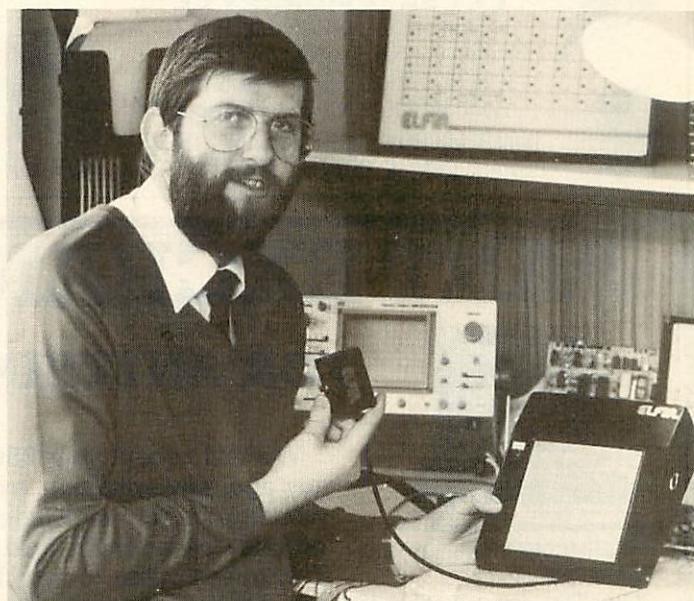
An exciting new development in microelectronic aids for the disabled is the My Voice speech synthesiser from Elfin Systems.

The device contains sufficient RAM chips to store the digitised data for up to 60 two-second phrases or 120 one-second phrases. These are stored using a microphone unit which plugs into the back.

The phrases are retrieved by means of a set of keys, located under a perspex grid which aids the disabled user. Pressing the correct combination of keys elicits the required spoken phrase from a loudspeaker.

The system is totally portable, running from rechargeable batteries strong enough to maintain continuous speech for several hours after an overnight charge. The most common communications aid for the severely disabled, as specified in DHSS guidelines has been an electronic typewriter - not something that can generally be used from a wheelchair when out and about. If the disabled person already uses a PC for other purposes then the machine may be driven directly from that computer.

Also a scanning keyboard for the severely disabled may be operated by the 'one switch' and 'two switch' systems - by



My Voice speech synthesiser, displayed by Elfin's MD, Steve Martin

depressing the switch when the appropriate light under the keyboard illuminates as the sequence scans over the keys.

For the BBC micro user, the My Voice unit will have an optional Concept Keyboard interface, and may be used to provide speech for activities which might need it, perhaps for a visually disabled person.

The quality of the speech is excellent because of its digital origin, and extension of the memory capacity to increase storage by up to four times will be provided. The package costs £950 excluding VAT. *Supastore* costs £37.50.

Compact Supastore

ESM has released a Compact version of its *Supastore* database management system. This version keeps all the utilities and user databases on the same 3.5-inch disc. The file structure is much the same as for the Econet version.

Supastore's simple operation makes it attractive for many educational establishments. Because it is so flexible it is also useful in the office or library. *Supastore* costs £37.50.

£££ SAVE TIME £££



USE OUR READY MADE GRAPHICS
AS A BASIS FOR YOUR ARTWORK
STOP PRESS/PAGEMAKER USERS



PAGEMAKER GRAPHICS LIBRARY

150 Cutouts (Pack 1)	£10.00
Utilities Disc	£6.95
30 New Fonts	£4.95
Cutout Previewer	£7.95
Font Previewer	£7.95
FSE to AMX Converter	£7.95



FLEET STREET EDITOR USERS



FLEET STREET GRAPHICS LIBRARY

200k (Disc 1)	£10.00
AMX to FSE Converter	£7.95

Also at £10.00

QUEST PAINT GRAPHICS LIBRARY
VIDEPAK 150 screen pictureshow

All prices fully inclusive of p&p
Europe add £3 outside Europe £5
State DFS format (40/80)
Educational orders welcome

£££ SAVE MONEY £££

Don't buy an ARCHIMEDES
until you've checked our price
e.g. 305 upgraded to 1 MEG free
Send SAE for catalogue & prices

Dept 2, MICRO STUDIO, 83 CLAY STREET
SOHAM, CAMBS. CB7 5HL. (0353) 721736



New ! SCRAPBOOK

A new free-format system for storage & retrieval of all types of information including colour and graphics. Incorporating two screen designers and facilities to search, sort, browse, print, extract etc. Forget fields, records etc, you store it how you want it. Disc. (40 or 80 Track) and almost un-necessary manual £12.95 incl. P&P.

Instant On-Screen Help

All BBC models can now have On-Screen help with our range of ROMs and Discs. Switch to and from any COMPANION with only one command from Basic or Wordprocessor.

WORDWISE COMPANION

For Computer Concepts Wordwise and Wordwise Plus wordprocessors.

BASIC COMPANION

Instant help for getting to grips with BASIC programming.

PROGRAMMERS COMPANION

Colours, Graphics, Sounds, VDU codes, ASCII codes, *FX commands etc.

MACHINE CODE COMPANION

Assembly language help, OS routines, 6502 instructions, Addressing Modes, Vectors etc.

All the above ROMs come with easy to follow fitting instructions £12.95 incl. P&P.
SPECIAL OFFER ! Buy any TWO and get one FREE !

STEPPER MOTOR CONTROLLER

Control two stepper motors and a relay direct from BASIC with 20 new 'star' commands. Ideal for plotters, turtles etc. With full instructions and program examples.

Combines the ease of use of Basic and the speed of machine code. ROM with easy fitting instructions £14.95 incl. P&P.

STEPPER MOTOR INTERFACE

Boxed unit which plugs into the User Port to control two 12V stepper motors and a relay. With an information leaflet on driving stepper motors.

VERSION 1. Powered from BBC auxiliary power supply. £23.00 incl. P&P.

VERSION 2. With mains Power supply (optically isolated) £46.00 incl. P&P.

Master and Compact Owners

Avoid the problem of limited ROM sockets. The above ROMs are also available in ROM IMAGE form on disc ready for loading into sideways RAM.

40 or 80 track disc. (Please state) £8.95 incl. P&P.

Disc Versions

Disc versions of Basic, Programmers and Machine code Companions. £9.95 incl. P&P.
All three Disc Companions on one disc. 40 or 80 Track £19.95 incl. P&P.

Demonstration Disc

With interactive demonstration and samples from all four Companions. £1.00 incl. P&P.

MICRO HELP
P.O.Box 17, NEWTOWN, POWYS. SY16 1ZZ.

PART EXCHANGE YOUR BBC

FOR ANYTHING WE CARRY IN STOCK



We will accept your BBC computer, any age, any condition, even non-working, in part exchange for any product we normally hold in stock. This offer applies to both BBC products and Amstrad computers.

A selection from our product range is shown here, and as you can see, our prices are very competitive. The allowance you can expect for your machine is detailed in the table opposite.

Just send your BBC (and manual please) to us with a cheque or credit card number, and provided we have the item you require in stock (please phone to check), it will be sent by return.

This offer means that Compshop has a number of second hand BBC 32K machines for sale, all with 3 months warranty. So if you want a BBC but can't afford a new one, phone us for prices and availability.

ARCHIMEDES from £918.85

AMSTRAD

PC1512SD £516.35

PC1512DD £642.85

BBC MASTER 128 £449.00

CUMANA DISK SYSTEMS

CSX100 £102.35

CSX400S £136.85

CS100 £125.35

CS400 £159.85

CD200 £188.60

CD800S £274.85

PRINTERS

CANON PW1080A £286.35

PJ1080A £485.85

EPSON LX800 £251.35

JUKI 6100 £320.85

6200 £516.35

MONITORS

MICROVITEC

1431 £193.20

1451 £251.85

1431AO £251.85

1451AP £286.35

PHILIPS 12" £90.85

PHILIPS MED RES COLOUR

..... £228.85

PHILLIPS Monochrome £79.35

ALL PRICES
INCLUDE VAT

CARRIAGE ON ANY ITEM
POST - £3.00 COURIER - £10.00

ALLOWANCE ON YOUR OLD MACHINE

	MORE THAN THREE YEARS OLD	THREE OR LESS YEARS OLD
WITHOUT ACORN DISK INTERFACE	£100	£150
WITH ACORN DISK INTERFACE	£150	£200

PLEASE DEDUCT £30.00 IF YOUR
BBC HAS ANY REPAIRABLE FAULTS

COMPSHOP PRICE PROMISE

We guarantee to match the price on equipment offered from stock through any other supplier.

Educational
enquiries and
orders welcome.

Quotations given.

One year
warranty on
all products.

COMPSHOP was established in
1978 and has continually offered
the best in micro computers
to discerning customers.

We sell only
computers and
peripherals, and
therefore can offer
the support many
other shops cannot.



14 Station Road, New Barnett, Hertfordshire, EN5 1QW
(Close to New Barnet BR Station - Moorgate Line)
Telephone: 01-441 2922 (Sales) 01-449 6596 Telex: 298755 TELCOM G
OPEN (BARNET) - 10am - 7pm - Monday to Friday
10am - 4pm Saturday

Unit 3, Albany Park, Frimley Road, Camberley
Telephone (0276) 22677

Siege software

Castle Under Attack is a medieval-age, strategy game from Fernleaf suitable for students from nine to 14.

Two sides work out strategies for attacking or defending the castle. Simple war-gaming principles are used, and strategies based on historical facts gleaned from a booklet provided with the package.

Authentic medieval weapons such as mangonels, seige towers and rams are employed. Two versions are provided varying in length and complexity. As the game may be long, there is a save facility which enables games to be stopped part way through and restarted.

The package is not intended to teach history - it's really problem solving in a more directed fashion.

The intention is for groups of children to co-operate to plan the best strategy and then adapt it later. Fernleaf points out that there is no attempt to simulate a real battle and, despite the machinery of war, no one in the program is killed.

The package is available for all BBC machines and further sets of 10 players' information books may be bought from Fernleaf for £4.95.

Contacts

Academic Software, Sourby Old Farm, Timble, Otley LS21 2PW. Tel: (0943) 88628.

Elfin Systems, Byard Road, Gloucester G12 6DS. Tel: (0452) 411533.

ESM, 32 Bridge Street, Cambridge CB2 1UJ. Tel: (0223) 65445.

Fernleaf, 31 Old West Road, Gravesend DA11 0LH. Tel: (0474) 359037.

Sherston Software, 8 Court Street, Malmesbury SN16 0LL. Tel: (0666) 840433. Wida Software, 2 Nicholas Gardens, London W5 5HY. Tel: 01-587 6941.

IBA, 70 Brompton Road, London SW3 1EY.

Peat Marwick, 345 Park Avenue, New York 10154, USA.

Publishing package for wide range of ages

Sherston Software's latest venture, *Typesetter*, is a desktop publishing package likely to appeal across a wide range of ages. It's simple and it may be run on any number of machines using the system disc.

The package does not include any graphics facilities. It is aimed at producing textual output, leaving boxes for illustrations. Three type styles can be used, the printer's character set and two headline fonts.

Typesetter minimises problems caused by constant disc-swapping, overlaying of page sections and importing of font files by reducing disc access.

It allows the user to create



Make headlines with *Typesetter*

boxes into which text may be typed which 'bounces off' the walls and may be word-processed. The options are

trolled through pop-up menus, so the package can be driven by younger children.

This package bridges the gulf between simple text handling packages like *Front Page Extra* and the more complex software such as *Fleet Street Editor* and *AMX Stop Press*.

To accompany *Typesetter*, Sherston has brought out an adventure, *The Fleet Street Phantom*. By solving a number of language problems children work their way up from junior reporter and are rewarded by being made editor!

Typesetter is available on 28 days approval at £31.65. *Fleet Street Phantom* costs £15.

Could do better

Combining the use of software with TV programmes and other media is too much for many teachers, says an Independent Broadcast Authority report.

The report, called *Interfacing Broadcast Educational Television and Computer Software*, is based on the use of two packages linked to two TV series, *How We Used to Live* and *Junior Maths*.

It casts doubt on the perceived quality of software in general and describes the specific packs as not being up to the standards of the programmes. However, software is seen as getting better, and the area of multi-media education is so new that the skills of the developers - and the teachers - are just evolving.

The interfacing is described as 'not totally successful' be-

cause of inadequacies of the software, the novelty of the enterprise, and the scale of what the teachers have to do.

Other factors were a 'culture gap' between the way adults and children perceive television and the fact that pupils treated software as a game. Also, an assumption that computers were readily available on the part of the software makers showed they might be remote from classroom realities.

Details are available from Christopher Jones at the IBA.

■ Another report, on micros in US higher education, estimates there is one machine per 17 students, but personal ownership boosts this to one for every five. Copies cost \$125 for institutions and \$1195 to companies from Peat Marwick in New York.

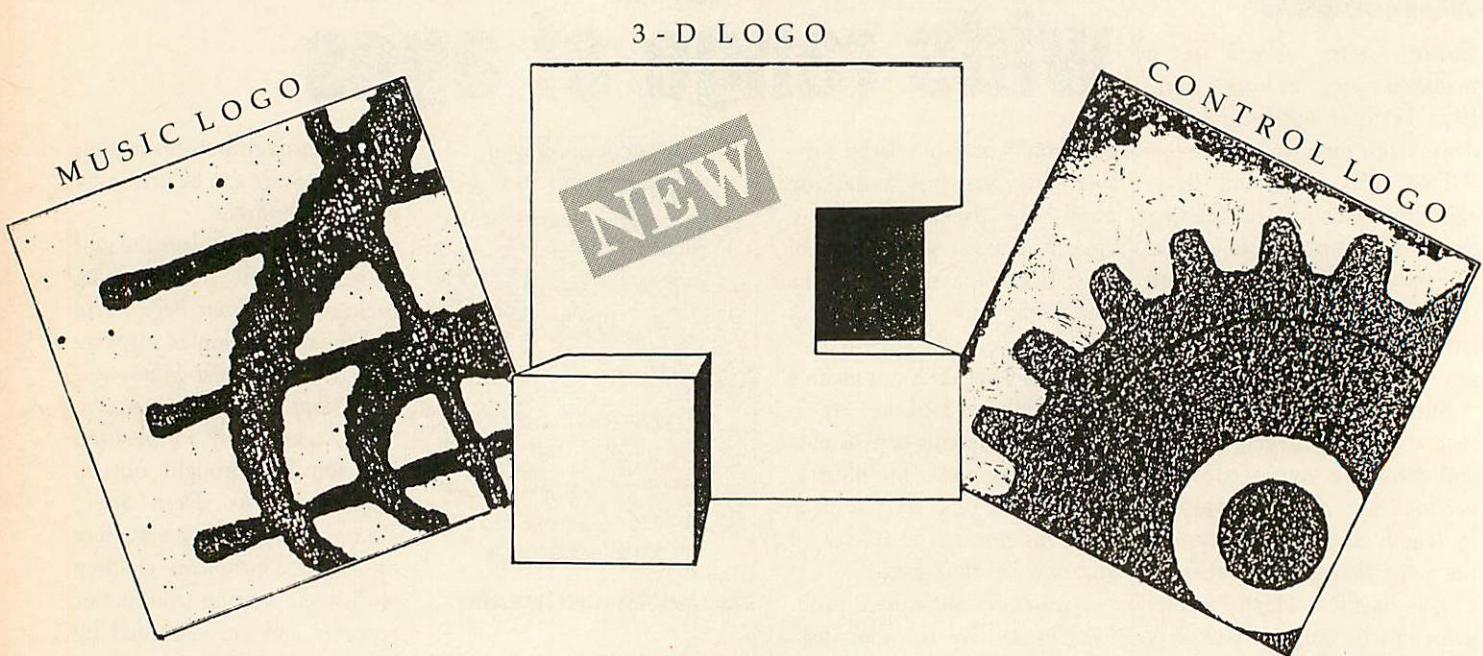
Handbook for language teachers

Using Computers in the Language Classroom by Christopher Jones and Sue Fortescue, (published by Longman at £6.95), is written for modern languages teachers hoping to use micros in the classroom.

Most linguists are not taking the computer seriously. As the book points out, the word-processor is an enormous aid to language development.

The authors concentrate on two sections - the first dealing with the things a computer can do, covering software's relationship to the language curriculum. The book's second section is practical, about hardware and software choice, classroom organisation and management. It is obtainable from Wida Software.

50,000 USERS SAY IT IN LOGOTRON LOGO



LOGOTRON

LOGO

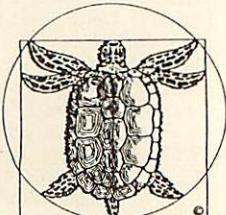
Turtle Graphics
List Processing
Mathematics
3-D Graphics
Logo Sounds
Sprite Graphics
Control Technology
Music Logo
Science Logo
Thinking Skills
Problem Solving
Logo Books
Floor Turtles
Databases
Welsh Logo
Hindi Logo
Spanish Logo
Network Logo
Adventure Games
Animation
Robots

LOGOTRON
LOGO
PRICE
REDUCED
TO
£44.00

Please send further details to:

AU1

LOGOTRON EDUCATIONAL PRODUCTS, DALES BREWERY, GWYDIR STREET,
CAMBRIDGE CB1 2LJ PHONE (0223) 323656

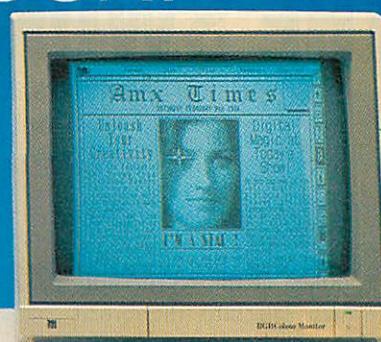


LOGOTRON
EDUCATIONAL
PRODUCTS

THE NEW AMX MK. III MOUSE. TRAP ONE SOON.



SUPER ART



STOP PRESS

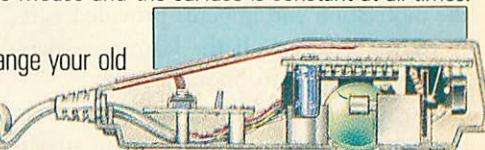
THE AMX MOUSE
MARK III AS SEEN
ON THE 'RISC'
MACHINE.

The MK III AMX Mouse is a product of Swiss precision and the result of a world-wide search to find a worthy successor to the AMX Mouse MK II.

The new Mouse has been specifically chosen to be the perfect partner to the ever expanding range of AMX software. The unique patented design includes high resolution D.P.I. and superior ball technology to ensure that contact between the Mouse and the surface is constant at all times.

There's a new shape too, that fits comfortably in the hand.

The AMX Mouse MK III costs only £34.99 or you can join the great "Mouse-Swap". Part exchange your old Mouse for the MK III for only £29.99.



* SUPERART

AMX MOUSE MK III PLUS SUPERART 16K ROM, PLUS DISC £79.99

Acknowledged as the most sophisticated, yet easy to use paint package available for the BBC Micro, it's no wonder over 20,000 have already been sold.

'Superart' features include cut, copy, paste, move, rotate, plus many, many more such as fantastic spray and zoom facilities.

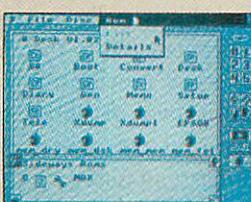
Available for BBC B, B+; Master 128, and Master Compact. Please state which version is required when ordering.

SUPERART (ONLY) £49.99

PICTURE GALLERY 2 x FLIPPY DISC £24.99

Instant art! A collection of fine drawings produced by acclaimed artists using superart.

* MAX 16K ROM £19.99



THE SWORD IN THE SOFTWARE

Using computers as part of a wider project is all very well in theory, but how does it work out in practice?

Chris Drage and Nick Evans

Last month we looked at the recent software releases which fall into the broad category of educational adventure programs. Many teachers new to, or shy of, computers frequently under-estimate the power of software to motivate children. With properly planned and soundly organised work, children can be successfully led into the rich imaginary world we discussed last month. Perhaps those that doubt the validity of classroom adventure programs see children as 'having fun' at the expense of skill and concept development.

This is not so. In the hands of the skilled teacher an enormous amount of learning can take place away from the micro with the motivation and impetus provided partly by the software. If the learning experience is enjoyable to boot then great!

To underline this, we will describe in some detail the incorporation of an adventure package in the classroom.

The Arthur Project concerns itself with the life and times of King Arthur and his knights of the Round Table. The Dark Ages era of Britain's history is much celebrated in legend and literature, but there are few facts and fewer contemporary sources. Teachers generally have problems finding resources and materials suitable for use in school. The *Arthur Project* pack is an assembly of multi-media materials which aims to present the Arthurian myths and legends in a proper historical context. The pack comprises a disc-based adventure program: *The Quest for the Holy Grail*, two stories on cassette, 20 transparencies with a taped commentary, eight project cards and four copy sheets. *Arthur* offers a complete set of pre-packaged activities which can be used immediately by any teacher. What is important about this package is the range of approaches, levels of understanding and teaching styles possible. But how is it received by a class of 30 nine-year-olds? Can the Dark Ages be 'lightened' by the *Arthur Project*?

On studying the pack and planning a strategy for its use with the class, it became apparent that the range of resources would need to be widened. Books were collected from local libraries, and a visit to a farrier



The package's Arthur does battle with the children's collage knight

arranged, so the class could gain some practical experience to support the project.

As this class had already studied life in Norman England, and had visited a Norman castle, they had some background knowledge of medieval life which would help them understand life in the Dark Ages. To provide further information and imagery, non-fiction titles about Celtic and Saxon life were obtained. The teacher's manual to *The Arthur Project* lists a bibliography of over 20 books.

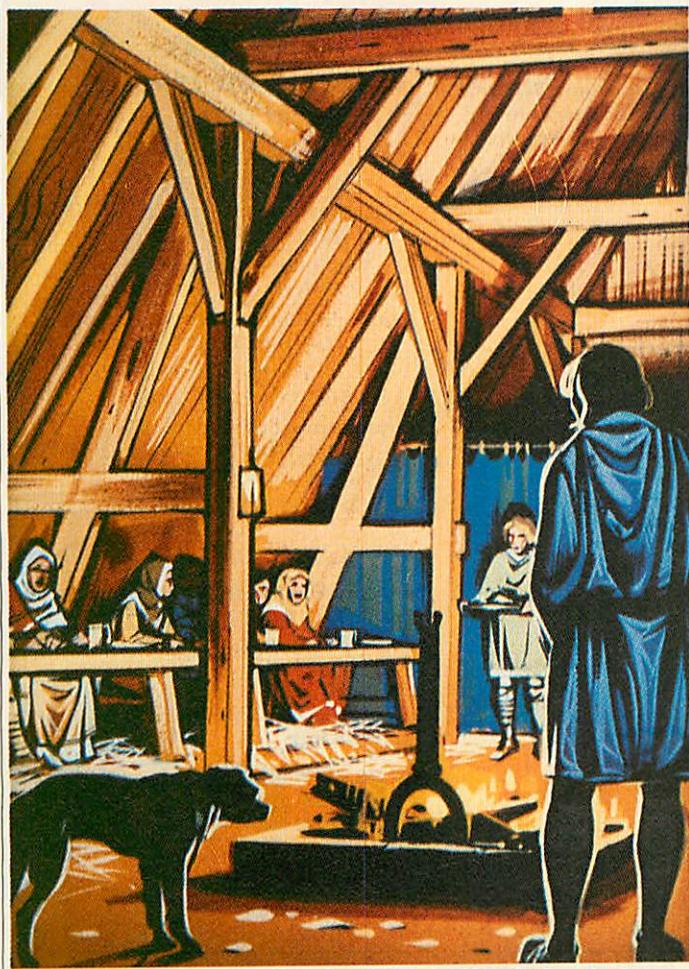
Only one copy of each project sheet is provided in the pack and this is really not enough. After a hasty telephone call to the publisher extra copies were provided – enough for one between two or three children. A quick preview of the project sheets which form the heart of the pack also revealed that the reading levels would prove difficult for about a quarter of the class. For those children who struggle with reading, the teacher should read each project sheet and discuss it with them in some detail. The four copy sheets were reproduced, an inviting wall display created, and the scene was then set.

The theme was introduced to the children by the sharing of a rousing Arthurian

legend read aloud by the teacher. Further background information was provided by the transparencies and taped commentary. This audio-visual presentation gave the opportunity for a good deal of discussion and provided additional motivation. The adventure program takes the form of an Arthurian legend *The Quest for the Holy Grail*. Success in this adventure depends not only on solving problems, but also on choosing the correct knight supporter at the right location, a choice based on each knight's attributes. The adventure was planned to be used as a springboard for creative writing, drama, art and craft.

Classroom organisation is always a major headache – hardly helped by the fact that there is often only one micro available. The software was introduced as a whole class lesson to ensure all the children were familiar with its aims and mechanics. This is an important step which should never be overlooked when planning software use.

They were then divided into working groups – by working in threes or fours computer time is maximised, and children can draw on a larger fund of ideas. The personalities of the children in each group play a vital role with this type of software.



Slides like these help to put the adventure in its historical context



Each group was given a set amount of time with the program while the rest of the class tackled related activities arising from the project sheet. This strategy proved very successful – children recorded their decisions and moves in the adventure so that positions could be quickly returned to. The teacher's role here is to encourage children to discuss strategies and not to accept defeat, but to try a variety of ploys. The children elected to record all their work on large charts which most wanted to compile into books or 'scrolls'. With the children engaged in so much related work, the teacher's role was chiefly an advisory one involving checking, correcting and encouraging those children experiencing some difficulties.

As the project progressed, class lessons in art and craft, and in written expression, arose from listening to the dramatised legends provided on the audio tape. Collages and paintings were soon in abundance, and one child constructed a model of a Celtic boat. Stories were written on the computer using the *Pendown* word-processor from Logotron. Here children really appreciated the range of fonts available. Particularly popular was the 'Oldeng'

font provided on the *Toolbox* disc. The satisfaction of having their stories printed in Old English script resulted in an excessive demand on the classroom micro. A second machine had to be co-opted from another classroom to enable the adventure to continue at the same times as the wordprocessor was being used.

Another interesting use of the computer in this topic arose from using *Pendown's Toolbox*. This disc contains a real gem of a program, *Sign Writer*. It enables large text to be output from the printer in a range of fonts. It didn't take the children long to realise that a variety of headings could be made for their project books and scrolls. When these were cut out, pasted and coloured in, the results were attractive. The children were approaching the micro as a tool to fulfil an immediate requirement. The foundations of desktop publishing were being laid too.

As the weeks passed, groups successfully completed the adventure, slowly at first, then with a quickening momentum. It was amazing the numbers of successful children who wanted to try again!

In total, the project took seven weeks to complete. During this time murals depicting

scenes from the legends were painted; pottery 'Holy Grails' were designed, modelled and painted; and butter was made in a jar with all the children taking turns to shake the cream – part of project sheet five. One group of children even wished to act out an Arthurian story. Almost all the children agreed the experience had been worthwhile and the visit to the farrier was the highlight of the project.

If an integrated approach to learning is best for primary school children, then computer software should reflect the same philosophy. It wasn't an accident that the adventure program in *The Arthur Project* took its place among a number of other equally important activities. *Arthur* satisfied the criteria for a successful educational adventure that we described in our article last month – it is original, encourages group work and work away from the computer, and is relevant to a wide range of subjects across the curriculum.

Arthur is available from Rickitt Educational Media, Ilton, Ilminster, Somerset TA19 9HS and Nene Valley Publishing, PO Box 49, Spalding, Lincs PE11 1NZ.

Price £34.44 (disc) or £36.74 (Master Compact) including VAT.

A WHOLE NEW BALL GAME

Tracker Ball is the professionals answer to cursor control. More accurate than a mouse. More responsive than a joystick.

THE FINE ART OF BALL CONTROL

TACKLES ANY APPLICATION

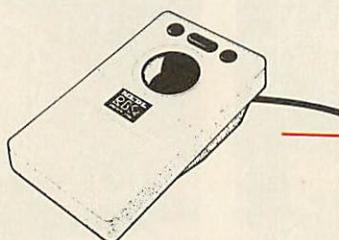
With 20 models, choose one tailored to your precise CAD/CAM, PC, ROBOTICS or control needs.

TIRELESS PERFORMER

For precision, it runs rings around all alternatives. With 360° freedom, you can move in any direction at any speed with the minimum of effort.

HARD TO BEAT

A tough military pedigree and the Marconi name promises a prolonged lifetime of reliability.



MEDL RB2 TRACKER BALL. A TOUCH MORE CONTROL

MASS DATA STORAGE - The Complete Solution

With more experience than any other company in the provision of hard disc storage for BBC users, Amcom can supply a range of ADFS compatible winchester drives, second to none.

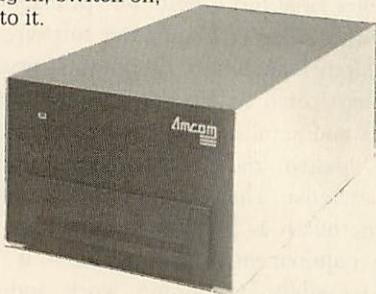
With storage capacities of up to 600 megabytes, Amcom winchesters are designed for use in demanding environments like schools, colleges, and universities as well as for industrial applications.

Connection of an Amcom winchester couldn't be simpler as it connects directly to the 1MHz bus socket of the computer by a 34-way cable. Plug in, switch on, and that's all there is to it.

NOW ONLY

£399

PLUS
VAT



Amcom for the complete mass storage solution



For further information on: Winchester hard discs, Educational networking systems or Tapestreamers, contact:

Amcom Software Ltd. 35 Carters Lane, Kiln Farm, Milton Keynes MK11 3HL. Telephone (0908) 569212

OFFICIAL DOMESDAY PROJECT CONTROLLER

WHERE TO GET YOUR HAND ON ONE

Farnell, Leeds
Tel: 0532 636311

Economics, Sheffield
Tel: 0742 690801

Technomatic, London
Tel: 01-208 1177

Watford Electronics, London
Tel: 0923 37774

J.S. Simmnet, London
Tel: 01-541 1495

Pineapple Software, Ilford
Tel: 01-599 1476

Metrotec, Sunderland
Tel: 091-514 7247

OR CONTACT

Marconi Electronic Devices Ltd,
Power Division,
Carholme Road,
Lincoln LN1 1SG,
England.
Telephone (0522) 29992
Telex 56163

MEDL
POWER DIVISION



Price List — Education

September 1987

Whittle Systems

For
YOUR NIMBUS PC
Expansion

APPROVED
 CUMANA DISTRIBUTOR

HARDWARE

CSR200	5.25" DSDD External floppy drive for Nimbus.....	£124.00
CRM20	20 Megabyte external winchester for Nimbus PC.....	£575.00
CRM30	30 Megabyte external winchester for Nimbus PC.....	£599.00
CRM40H	40 Megabyte, high speed external winchester.....	£899.00
CRM60H	60 Megabyte, high speed external winchester.....	£1095.00
DTI MODEM CABLE	to Nimbus AUX port.....	£9.95
8 BIT PARALLEL PRINTER CABLE	£19.95

SOFTWARE

NIMBUS VIEWDATA	Complete local Viewdata package (includes NVD-EDITOR, NVD-DISPLAY, NVD-TUTOR, Modem cable)	£95.00
TRAPDOOR	The ultimate debugging aid..... (also available for IBM PC, APRICOT PC, XI, XEN)	£49.95
ZEM	Z80 CP/M Emulator.....	£49.95
CP/M 80 Programmer's Guide	by Morrell & Whittle....	£8.95

Network prices of software

Up to 8 stations @ 3 x standalone price
Up to 16 stations @ 4 x standalone price
Up to 24 stations @ 5 x standalone price
Up to 32 stations @ 6 x standalone price

All prices exclude P & P and Vat.

9, Herschel Crescent,
Littlemore, Oxford OX4 3TS

Tel 0865 711956

SOFTWARE

YOUR OWN VIEWDATA SYSTEM

KIDS, from Starters Software, lets you set up your own local teletext database.
Manek Dubash investigates

Viewdata is becoming a fashionable medium for electronic publishing, and it's not just confined to large on-line databases like Prestel. Local systems, running on a single micro or a network rather than being accessed over the phone, have been discovered by schools and colleges as a simple but effective way of creating a high-tech local 'magazine'.

Now Starters Software offers a local viewdata database aimed specifically at schools and colleges. It describes KIDS (Kinetic Information Display System) as a real stand-alone videotext system for education. KIDS costs £39.95, or £78.95 complete with a numeric keypad. A teletext screen editor is available as an extra.

The screens look similar to broadcast teletext but are hierarchically linked, giving far greater capacity. KIDS can provide, for example, an electronic notice board or magazine limited only by the BBC micro's disc drive and mode 7 text and graphics. Being local, KIDS avoids expenses like modems and phone charges, and gives teachers direct control over the material. It also introduces another element with animated frames.

The package consists of the manual, a ROM chip, two discs containing utilities and a sample database to demonstrate the system and give you something to play around with.

The minimum hardware required is a BBC micro with Basic 2 and a single-sided 40-track disc drive. If that's all you have you can get around 110 frames in your database. Two drives at double density give about 1880 frames, while the more normal configuration of two double-sided, single-density drives has room for some 1110 frames. Even so, I had to do a good deal of disc swapping, so for ease of use and reasonable capacity, dual drives are almost essential. KIDS compresses its frames, using on average of only three disc sectors each, increasing disc capacity by up to 25 per cent.

The program appears not to be sensitive to non-standard disc filing systems - I used Solidisk's and Watford's without problems



KIDS is an educational database

- but because KIDS directly manipulates the disc files the package will not work with ADFS. The utilities won't work with shadow RAM, but the database, once set up, isn't fussy in this respect.

The manual covers booting up the KIDS database, using the utilities and some technical information. Step-by-step instructions guide new users through setting up while stressing the importance of planning a database carefully - good advice irrespective of the system you're using.

My only gripe is its lack of information about the database structures used by KIDS, so experimentation with the sample material will not be a waste of time.

The manual also tends to mention 'carousels' with little explanation and has no filing system compatibility information.

The software compensates for the manual's deficiencies; it is menu driven and users are fully prompted. Mistakes are well catered for - I found that could not fool it with a rogue keypress - and it's usually possible to change your mind half-way through an operation.

After inserting the ROM, booting up the utilities disc brings up the front menu display. The 'set up' option is highlighted until the system is installed - a nice touch. Most of the other options are best left until the user has become more familiar with how the system works.

Setting up is a once-only job and is simply a matter of following the prompts. The settings are automatically saved to the utility disc and need be altered only if the

hardware changes. KIDS takes 10 minutes to initialise the database discs by creating an index and files to contain the frames.

The next step is to map out the database and create the frames. KIDS creates animated or static frames. The animator stores each movement around the frame which, when displayed, repeats the movements made in drawing it. The delay between each movement is user definable. For static frames, I found it easier to use a teletext editor but pages can be from any source.

All that remains is to slot the frames into place, following self-explanatory prompts, but remembering that certain frames have special functions. For example, keying *90 means 'quit' so frame 90 must say goodbye! And carousel frames - displayed if KIDS is left alone for a while - are always pages 251-259. If a Solidisk real-time clock is fitted, the time and date will be shown.

Other menu options are concerned with database management, such as viewing log frames and frame links. Log frames record the popularity of each frame, allowing the database manager to respond to demand. Linking frames is simple, provided the database has been fully planned, and involves anticipating and routing every possible keypress.

An individual or institution with a large collection of teletext frames could find a use for KIDS. It is powerful, offering animated mode 7 screens, efficient frame storage, full user control and a potentially complex structure.

But not every school will have the expertise on tap to exploit KIDS' full potential: one teacher told me he felt schools would need someone fairly knowledgeable to set up and maintain the system, but careful examination of the sample database could pay dividends here. Finally, in the manual and the sample database some misspellings crept through the net - not recommended in an educational package! With those few caveats, I have little hesitation in recommending KIDS as a thorough and exciting piece of software.

KIDS is available from Starters Software, PO Box 4, Brecon, Powys LD3 7JS.

No. 1 Leader of the Pack

Artroom

SAVE UP TO £12.90

£30 5 1/4 inch Disc (ADFS ONLY) £34 3 1/2 inch Disc
With Digimouse add £35

The ARTROOM pack consists of ARTROOM and ACE (Artroom Colour Extension). ARTROOM is an icon based full screen graphics package which can be controlled by mouse or keyboard. All the usual features are there including 'cut and paste' and our highly acclaimed ZOOM option plus an extensive graphics library to help you produce pictures quickly. An advanced printer dump is also supplied.



'ARTROOM...the best there is.'—
Acorn User Feb '87

'ARTROOM is the software for you.'—
A & B Jan '87

Choice of 5 packs

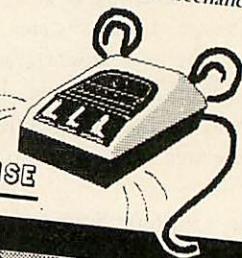
ACE consists of two programs. COLOURIZER enables you to produce MODE 1 colour versions of ARTROOM screens and to dump them to a printer using a shaded printer dump. The MODE CONVERTER program will convert any graphics screen into a Mode 4 ARTROOM screen ready for loading into ARTROOM. Conversions can be made from Modes 0, 1, 2, 5 and 7, yes SEVEN!

...very pleased with the way Clares have introduced the colour facility.' A & B June '87.
ARTROOM and ACE will work with any mouse but we recommend DIGIMOUSE because it is well engineered using a non-slip ball and optical encoders. DIGIMOUSE also includes the unique 'LINEAR LOCK' facility that enables you to draw straight lines freehand.

...impressed by Nidd Valley Digimouse' A & B June '87
This complete package is marketed by Olivetti in Italy, the home of style and design.

ACE

A STROKE OF GENIUS!



DIGIMOUSE



BETA-BASE

SAVE £7

£30 5.25 inch Disc £34 3.5 inch Disc

The Beta-Base pack consists of Beta-Base, the number one database for the BBC micro, and Beta-Base Utilities which extends the power of Beta-Base.

The Beta-Base Utilities provide seven new utilities. There are more powerful versions of Search and Sort and there is also a Mail Merge program which creates perfectly formatted letters containing data from your files.

'We use Beta-Base ourselves'
Mike Bibby, Editor of
MICRO USER.

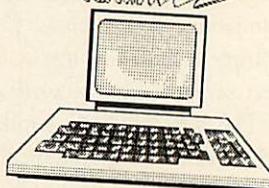
'Rated best value for
money'—ACORN USER Dec '84

RAMROD



UTILITIES PACK

SAVE UP TO £30



£50 5 1/4 inch disc £60 ROM £54 3 1/2 inch disc

The UTILITIES PACK consists of RAMROD and MACROM. RAMROD is the ultimate toolkit ROM and it is compatible with the whole BBC range and includes a disassembler plus editors for DFS, ADFS, RFS, memory, Shadow memory, Sideways RAM, Tube plus lots more. RAMROD will take you to the furthest reaches of your machine and enable you to boldly go where no ROM has gone before!

'an ingenious collection of utilities...' BEEBUG Oct '86
'worth its weight in gold.' A & B Jan '87

MACROM is a fast full featured MACRO ASSEMBLER that allows the use of macros, which are loaded from disc. MACROM has its own easy to use editor which automatically formats your source code. A HI version of MACROM is supplied for use with the second processor. A macro library and demonstrations are also supplied.

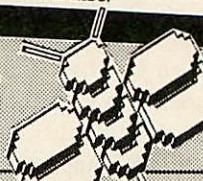
'Full marks for an excellent product.'—BEEBUG JUNE 1986

We are also making BROM+ available under this offer. Its main feature is the full scrolling BASIC editor which allows the user to edit a program as if dealing with text in a wordprocessor. There are many other features dedicated to making life easier for BASIC programmers.

'This is the best BASIC screen editor I have so far used.'
—MICRO USER August 85

For BROM+ add £25 on ROM,
£20 for 5.25 inch disc or £22 for 3.5 inch disc.

Suppliers of top quality software for the range of Acorn Computers



Fontwise + Pack

SAVE £10

£34 3 1/2 inch Disc

£30 5 1/4 inch Disc

The FONTWISE+ pack contains FONTWISE+, the FONT EDITOR and 22 fonts. FONTWISE+ enables you to print very high quality text in a choice of 22 different fonts and 3 sizes. You do not need a special printer, just an EPSON RX or FX compatible. High quality is not the end of the story because you can also have both proportional and justified text. The output has to be seen to be believed.

FONTWISE+ is compatible with WORDWISE, VIEW, INTERWORD, MINI OFFICE II and EDWORD II.

'FONTWISE is better than many NLQ packages'—ACORN USER Sept '86

The FONT EDITOR is very easy to use and allows you to edit the current fonts or create new ones. Reviewers have praised the editor for its ease of use and faultless presentation.

'editor is impressively quick, smooth and easy to use'—A & B
EDITOR '...puts all previous designers to shame.'—BEEBUG July '86

Ask for a sample printout.



DON'T FORGET, YOU CAN ORDER WITH ACCESS CARD TOO!

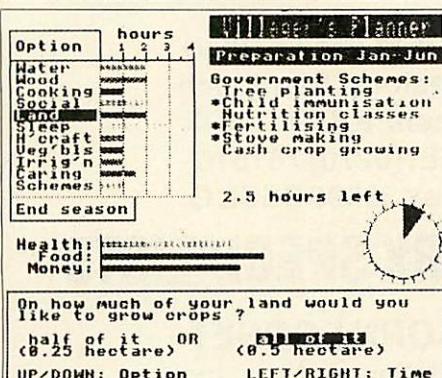
Clares

98 Middlewich Rd Northwich
Cheshire CW9 7DA Tel: 0606 48511

EDUCATION

SOFTWARE

STRANDED IN THE SAHARA



Sand Harvest; Longman; BBC micro; £28.75 (disc).

Enter the simulated world of *Sand Harvest* and you take on the role of either a Tuareg nomad, a Songhai villager, or a government officer. You must battle against the encroaching Sahara while struggling to keep your animals fed and watered, grow sufficient food to feed the townspeople as well as your own community, and raise cash to pay the tax man. Success requires careful planning, and thoughtful decision making.

The actions of the characters are interrelated with natural conditions and world forces to determine the effect on desertification, the fate of crops, trees and water supplies; population, life expectancy and wealth; and to discover the success of government schemes.

At the end of every year there is a report giving details of how all the variables have changed, comparing maps of the region before and after, and an explanation of what has happened. The software manages to present a lot of information in an understandable way. Annual reports can be printed for future reference.

The flexibility of the program is increased by the facility to change just about any variable influencing events, from the state of the exchange market to the level of annual rainfall.

Set-ups can be saved on disc and returned to later. A simple set-up is available at first enabling a feel for the simulation to be established quickly.

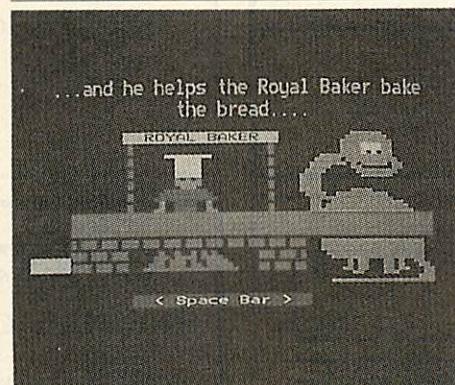
The program comes with a wealth of well-produced material - handbooks for the nomads, villagers and government officers as well as the organiser, with the relevant parts being freely photocopiable,

and a wall chart with background information on Mali. The booklets are crammed with detailed local facts and provide a resource to make the simulation meaningful and captivating. Also included are many hints about introducing the program into the classroom and managing its use.

This package is a very valuable tool in the hands of the educationalist striving to encourage awareness of the world community. My only fear is that if it is used superficially by people used to switch on and go software, it will be wasted: *Sand Harvest* deserves better than that.

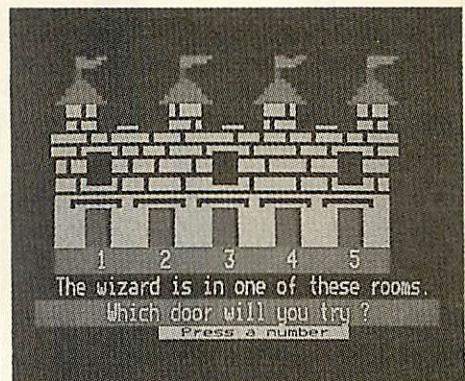
Stephen Cole

CAN YOU CURE CUTHBERT?



Cuthbert Catches a Cold; Selective Software; BBC Micro, Master series; £22.94. Dinosaurs are always a popular subject with younger children and so you should have no trouble interesting them in this program from Selective Software.

The story revolves around Cuthbert - a green and cuddly brontosaurus. Cuthbert has caught a cold; to cure him it is necessary to find some magic fruit. The three parts of the adventure each require different skills. The first part is to find the wizard who will help you in your quest. You then visit Rhymeland and finally go to Playland to meet the Queen of Hearts. As well as the adventure disc there is a disc containing two cartoon stories and a selection of tunes. The story disc was impressive - Selective has used *Movie Maker* for the graphics and the result is excellent. The package comes with a storybook and a teacher's manual with suggestions for follow up activities. There are activity cards and Concept Keyboard overlays for use in the classroom - a comprehensive package.



Children must solve puzzles to cure Cuthbert

One problem in many primary schools is the lack of contact time, but *Cuthbert* has lots of suggestions for activities that can be done away from the computer. This is an excellent program. Congratulations, Selective, on a well thought out, very professionally produced pack that will stimulate lots of back-up work.

Godfrey Hall

IN SEARCH OF A PRINCESS

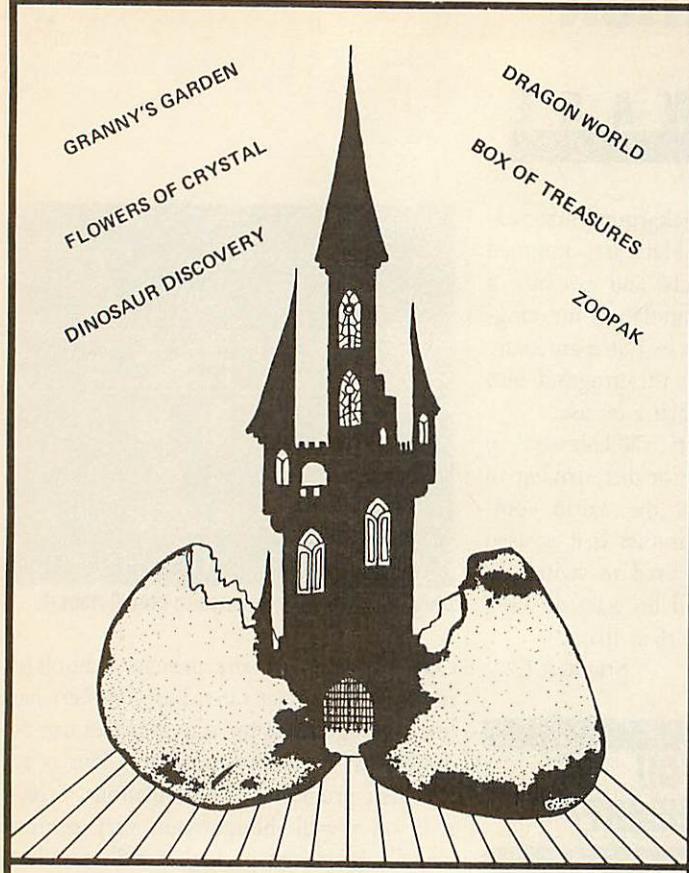
Droom; HUMMEC; £15.95 (disc).

Droom is an excellent mathematical adventure from the Humberside Microelectronics in Education Centre. The story is about Henry the frog who is really a prince, and the task is to free the princess so that she can turn Henry back into a prince. The story book accompanying the program introduces the characters and sets the scene. To progress through the adventure the children must solve several mathematical problems and puzzles.

Children can work on one part of the program at a time or work through the whole adventure. Also teachers can link it to other activities, leading the children from maths into other areas of the curriculum. It is a very flexible program in that it need not be finished in one session - it is written in such a way that you can dip into it whenever you like. The accompanying booklet includes many activities to cover away from the computer, and a list of follow up ideas. A case study is also included to show how the program can be used with special needs children.

The supplementary disc includes several programs which can be used for follow up.

Godfrey Hall



4MATION EDUCATIONAL RESOURCES

Linden Lea, Rock Park, Barnstaple, Devon EX32 9AQ
Telephone: (0271) 45566 Telex No: 42513 Shareit G. 4MAT

SEND A5 S.A.E. FOR CATALOGUE

ACORN'S LARGEST DEALER

3SL LTD

501-511 Crewe Road
Wheelock, Sandbach
Cheshire, CW11 0QX
TEL: (0270) 761516
Telex 36696 SSSL G

NETWORK SPECIALISTS

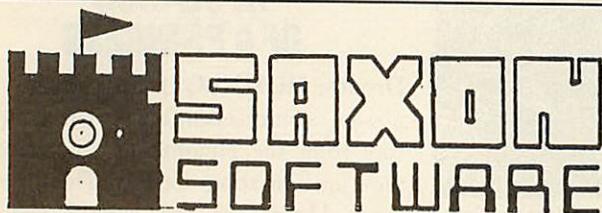
ACORN ECONET

Installations In Education
Industry & Commerce
In UK & Europe

Full service contracts available
Acorn & IBM Networks

Contact

Leon Ditte
ian Cooper



2 NEW GAMES FOR THE CLASSROOM
A NOVEL APPROACH TO SOCIAL STUDIES
FOR 11-14 YEAR OLDS
DESIGNED BY TEACHERS,
TESTED AND APPROVED BY CHILDREN

★ BECAUSE IT'S THERE – a program which informs and tests on the History, Geography and logistics of the ascent of Everest.

★ THE WAY WEST – a simulated journey by wagon train across America in 1840.

★ For BBC Model B or Master ★

EACH £10.95 inc. post and packing
or BOTH on 1 FLOPPY DISK £15.95
WITH Teachers' and Pupils' Notes

Further information and orders:

15 Allen Road PETERBOROUGH PE1 3BT

G-TEN LIMITED

THE MAIL ORDER SOFTWARE HOUSE

BBC MICRO	TAPE £	DISC £	3.5" £	Paperboy.....	7.25	11.25	N.A.
				Konami Coin-op.....	7.25	11.25	N.A.
				Temple of Terror.....	6.50	10.75	N.A.
				Round Heads.....	N.A.	11.25	N.A.
				The Hunt.....	8.50	10.50	N.A.
				Arkanoid.....	6.75	N.A.	N.A.
				S. Fox Strip Poker.....	N.A.	10.50	N.A.
Commando.....	7.25	11.25	N.A.	PERIFERALS (P&P £1.50 p/item) OUR PRICE			
Airwolf.....	7.25	11.25	N.A.	Amx Mouse.....	75.25		
Repton 3.....	7.25	9.75	11.25	ATPL Sidewise.....	41.50		
Strykers Run.....	7.25	10.50	11.25	ATPL Sideview +	30.00		
Crystal Castles.....	7.25	9.50	N.A.	Quickshot II	6.50		
Dodgy Geezers.....	7.25	N.A.	N.A.	Quickshot I Turbo.....	11.50		
Ravenskull.....	7.25	9.50	N.A.	BBC Quickshot.....	3.50		
Thrust.....	6.50	9.50	N.A.	Competition Pro 9000.....	12.50		
Yie Ar Kung Fu.....	7.25	11.25	N.A.	BBC Joystick Interface.....	7.50		
B.C. Football Fortunes....	7.25	11.25	N.A.	ELECTRON		RRP	OUR PRICE
Acornsoft X.....	7.25	9.75	N.A.		£	£	
Questrobe.....	4.25	N.A.	N.A.	Xor.....	9.95	7.25	
Rebel Planet.....	4.25	N.A.	N.A.	Five Star Games 2.....	9.95	7.25	
Yie Ar Kung Fu 2.....	7.25	11.25	N.A.	Micro Power Magic.....	7.95	6.50	
Citedal.....	7.25	9.75	11.25	Superior Col. V3.....	9.95	7.25	
Strike Force Harrier.....	7.25	10.50	N.A.	Ravenskull.....	9.95	7.25	
Speech.....	7.25	9.75	N.A.	Repton 3.....	9.95	7.25	
Starquake.....	7.25	11.25	N.A.	Commando.....	9.95	7.25	
Elite.....	10.50	11.25	15.25	Football Manager.....	8.95	6.50	
Trivial Pursuits.....	11.25	16.25	N.A.	Crystal Castles.....	8.99	6.50	
Scot Adams Scoops.....	7.25	N.A.	N.A.	Paperboy.....	9.95	7.25	
Revs.....	9.75	10.50	11.25				
Sentinel.....	7.25	11.25	N.A.				
Five Star Games.....	7.25	N.A.	N.A.				
Firetrack.....	7.25	11.25	N.A.				
Superior Collection 1.....	7.25	9.75	11.25				
Superior Collection 2.....	7.25	9.75	11.25				

Please allow 14-28 days delivery. Please add 75p P&P per item (Inland/BFPO only).
European orders add £1.50 P&P per item (inc. N.I/Eire).
Elsewhere add £2.50 P&P per item. Please make cheques or postal orders (Sterling only) made payable to: G-TEN LIMITED.

UK or BFPO Orders, please send to:
G-TEN LIMITED, DEPT AU10,
FREEPOST (no stamp needed),
LONDON E1 6BR

Overseas Orders send to:
G-TEN LIMITED, DEPT AU10, 1st FLOOR,
146/150 COMMERCIAL STREET,
LONDON E1 6NU

Telephone Enquiries Tel: 01-377 2630 24hr answer phone

THE NETWORK PAGE

Finding files on a network can be a problem. Here we present a directory menu to make things easier

Robin Newman

Most catalogue and menu selection programs available for the BBC micro do not meet the needs of an Econet installation, although because of the similarity between ADFS and ANFS, more recent ADFS menu programs are usable. This article describes a suitable program.

Before tackling such a program it's best first to list the things the program should do. I settled on:

- Displaying all the entries in a directory that you select.
- Displaying the *INFO details for each separate entry.
- Be able to LOAD, CHAIN, *LOAD or *RUN a selected file.
- Indicating whether the user has read access to the entry. If the user has insufficient access, then trying to access the file should not crash the program with an insufficient access error.
- It should be able to explore the directory tree structure, entering sub-directories and then climbing back up the tree to the starting point.
- The controls should be easy to operate, and the program should be compatible with Acorn level 2 and 3 and SJ file servers, as well as with all official versions of NFS and Basic.

It is desirable to hold all of the directory's information in memory at once, to cut out access to the file server each time a different file entry is examined. In the event, this is possible for Acorn file servers but not for SJ file servers for reasons that I shall describe.

Using the Osword &14 file server call, with a function code of 3, it is possible to glean all of the information about a file within the space of a 27-byte entry. With a maximum of 254 entries possible in the directory, this requires a data buffer of at least &1ACA; say &1B00 long. This means there is too little memory left to squeeze the program into and still work in a graphics mode. Only mode 7 gives enough space. In order to fit in up to 254 entries, the display has to be paged, with up to 45 entries displayed on each page. The cursor keys move a highlight bar around the

Offset	Description
0	Doesn't matter
1 {	Four-byte address of data buffer F
4 }	

After the call, the data buffer contains:

Offset	Description
0	Zero
1	Length of directory name
2	Directory name as an ASCII string; no carriage return at end
LEN+1 {	Zero for owner access, 255 for public access
LEN+2 }	

Figure 1. Parameter block to get access rights

Before call		
Offset	Value	Description
0	0	Indicates file server call
1	18	Size of block
2	0	Reply port (filled in by NFS)
3	18	Function code (get file information)
4 {	0	Context handles filled in by NFS
6 }	5	Argument for call: get attributes
7		Filename terminated by
8 }		Return
18 }		

After call

0	Zero
1	Size of block, &12
2	Command code: 0 if all is well
3	Return code: zero if all is well
4	Zero=not found: one=found a file: two=found a directory
5 {	Load address
8 }	
9 {	Executive address
12 }	
13 {	Size
16 }	
17 {	Access byte
18 }	
19 {	Date
20 }	Zero = user has owner access &FF = user has public access

Figure 2. Osword &14, function code 18

entries on the page. Following or preceding pages can be accessed by trying to move the bar off the right- or left-hand sides of the screen.

File and directory names are distinguished by colours. A separate area of the screen is used to display instructions and *INFO details for any highlighted filename. In addition there are four options, selected with the number keys 1 to 4, which enable the file to be LOADED, CHAINED, *LOADED or *RUN.

Determining the access to the file, owner or public, is difficult. The coded access string is available in the 27 bytes of information supplied by the file server. For Acorn file servers you can determine whether you have owner or public access to the directory by using one of the functions of the Osgpb call in FNprivename, using the parameter block shown in figure 1.

For SJ file servers the procedure is more complex. SJ employs a storage space accounting system, whereby each directory and each file is allocated to one of 256 different user accounts numbered from 0 to &FF. Each user may be given ownership of any of these accounts, and it is this which determines whether the user is owner or not of a given file. So you can have owner access to a directory but only have public access to some of the files in it! All this is very confusing, but it allows the network manager to put in a directory files which are totally protected against being altered or deleted, and yet which can be freely used, while at the same time the user can add and delete other files to or from the same directory.

So, whenever a file is created on an SJ file server, it is marked with the account number of the person who created it. This file can be read, written to or modified only by people with the same account number! It is quite possible to have files in your 'own' directory that you cannot read, but other people can – if the file belongs to 'their' account.

In order to indicate the access that a user has to a specific file, SJ prints the relevant

access letters in upper case. For example, imagine a file called PROG with access string WR/WR. If it were allocated to an account owned by the user, then its access would become WR/wr. If an account were not owned by the user then its access would be wr/WR. This information can be gleaned from Osword &14 function 3, by using an expanded version of the call which prints out all the file information as a formatted string. But it would take an inordinate amount of memory to store the string for 243 files! An alternative file server call is employed by FNowner, which uses Osword &14 with function code 18. This call returns the catalogue information on a named file including a byte to indicate whether the user has owner or public access. The access byte is not returned like this on an Acorn level 2 file server. The parameter blocks used with the file server call are shown in figure 2.

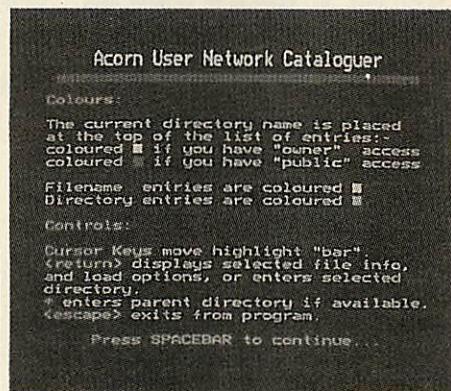
The procedures and functions used by the program are listed in the box on page 155. The three types are those involved with communicating with the network, those involved with processing the data received and those involved with displaying the information on the screen and making directory and file selections.

Looking first at the network procedures, PROCassm loads the file details into the machine. It uses calls to Osword &14 with function code 3 and argument 0 to return information on four files at a time as shown in figure 3.

Having fetched four entries, the machine code copies them from the parameter block to the data buffer, stacking entries end to end. The comments in the listing should enable you to follow how this works. The second section of machine code extracts information from the large data buffer by moving a pointer to the beginning of a given 27-byte entry, and copying the file/directory name found there into a string buffer used by FNname.

FNsj uses another file server call with function code 25. This returns a string giving the version number of the file server. All SJ file servers have the letters ST at the start of this string, and so it is a convenient way of determining whether the file server is one of the company's.

PROCod and PROCnd were originally written by SJ Research to whom thanks are due for permission to use them. They were first presented last October at the Econet Conference organised by ME Electronics of Reading. They enable you to switch



Cataloguer instruction screen

Before call

Offset Description

0	Indicates file server call
1	Size of block, &12
2	Reply port (filled in by NFS)
3	Function code 3
4 {	Context handles filled in by NFS
6 }	Argument for call: zero means get all info
7	Entry point to directory, zero for first call
8	Number of entries to fetch
9	Directory name terminated by Return. Return alone fetches from current directory
10	

After call

0	
1	Size of block, &12
2	Command code: zero if all is well
3	Return code: zero if all is well
4	Number of entries examined
5	Directory cycle number
6 {	Entry name (padded with spaces)
15 }	
16 {	Reload address
19 }	
20 {	Execution address
23 }	
24	P D L W R W R in bits 6-0 (P, SJ only)
25 {	Date last updated
26 }	
27 {	System internal name (Acorn)
29 }	
27	Main account no. (SJ)
28	Main/Aux. Acc. top four bits
29	Aux. Account no.
30 {	Size of file
32 }	
33	27 bytes repeated for next file.

Figure 3. Osword &14, function code 3

between directories on the network, saving your original position and then switching back later on. This enables you to over-

come several shortcomings of the Acorn level 3 file servers, for example the lack of *DIR ^ to enter a parent directory. The *DIR ^ command is on the new Filestore!

Essentially, by saving the position, or context, of the directory you are in when you first run the program, a succession of *DIR commands can be used to move down the tree. To move up one level, the equivalent of *DIR ^, PROCod is used to return to the original directory, then all but one of the downward *DIR commands complete the job. This process seems quite complex, but it avoids having to climb above the starting directory by using the file's 'full' pathname, for example, \$Startdir.Subdir1.Subdir2.

The problem with using *DIR \$.startdir.subdir1 on an Acorn file server is that because the directory is accessed through the main root directory, you get only public access to any files. Even if you are the owner of the directory, you lose owner access as soon as you use *DIR \$.

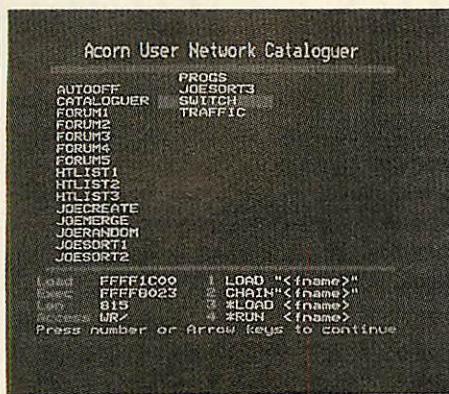
On an Acorn level 3 file server, there is a way of overcoming this problem. If your 'user root directory' - the one you start in when you log on with *I AM - is 'startdir', then *DIR &.subdir1' has the same effect as *DIR \$.startdir.subdir1', but you don't lose owner access. In other words, \$ indicates the main root directory and & your own main directory.

The *DIR command is missing from Acorn Level 3 file servers, but is present in SJ file servers and in ADFS. If you are in '\$.startdir.subdir1' typing *DIR ^ will take you back to '\$.startdir'. This is simulated in PROCod by performing a *DIR and then a *DIR startdir' to go back to the original directory and then enter the directory above subdir1.

You may also be interested in the network (and ADFS) *FIND utility published in September's Acorn Forum. This program searches the directory tree for a file and displays the full pathname of that file.

PROCaddr processes the loading information for a given entry from the data buffer. The access string data is the tricky bit - the access byte is taken from the data buffer and then the ownership of the entry is checked by FNowner. The variable ra% is set to TRUE if the user can read the file. FNas and FNtrib turn the access byte into the normal access string of letters eg, WR/WR.

The two central procedures in the third group are PROCdisplay and PROCselect. PROCselect checks that there are some



Cataloguer's net directory

files in the current directory. If all is well, it selects the starting position for the highlight bar. This will highlight the first entry unless the last command was '^' (select parent directory), in which case it will be set to the position of the subdirectory within the parent.

The highlight bar is printed by positioning a black background teletext control character at the right-hand end of the bar, and then positioning a new background code just before the bar. The black background code can't be printed for the very last entry of each page, as it would cause the screen window to scroll. Instead, a black background character is placed by the window enlarging, printing the character in the required place, and then restoring the window to its normal size.

The main selection loop tests for the cursor keys, the Return key, and the '^' key. The cursor keys cause the value of ns% (the next entry to be highlighted) to be calculated. PROCscreen and FNnewns calculate this value, allowing for horizontal shifts to the next page of entries 'left' or 'right', and checking whether the maximum entry has been reached. PROCprint is selected by the return key. If the current entry is a directory, then PROCdir is called. Otherwise PROCprint prints the *INFO information on the screen and then offers the LOAD, CHAIN, *LOAD or *RUN options.

PROCdisplay modifies both the page number, and the number of the first entry to display if the previous command was an '^'. Next the name of the current directory is printed by FNprivname, using the appropriate colour. A check is also made to see if the directory is empty or not. If so, the parent directory (if any) is automatically reselected. Two nested FOR...NEXT loops are now used to display the entries in three columns. The variable end% can force an exit from these loops when the last

PROCasm	Assembles code to get current catalogue details
PROCaddr(S%)	Extracts file address and access details
PROCdisplay(P%)	Displays 45 entries starting from entry number P%
PROCselect	Controls selection of an entry with the highlight bar
PROCscreen(D\$)	Selects next or previous page of entries to display
PROCinit	Initialises various parameters, dimensions, arrays, etc
PROCtitle	Writes the main title
PROCintro	Writes introductory instructions page
PROCprint	Checks whether entry is a directory or file. For the latter, writes address info on the screen and selects LOAD, CHAIN, etc. For the former selects new directory
PROCOPTIONS	Checks if user has read access. Prohibits loading if not
PROCnogo	Prints insufficient access message
PROCAccok	Read access OK, prints LOAD, CHAIN selections, etc
PROCclear	Clears bottom window on screen
PROCload	Inserts LOAD "fname" into input buffer
PROCchain	Inserts CHAIN "fname" into input buffer
PROCstload	Inserts *LO. fname into input buffer
PROCstrun	Inserts *RUN fname into input buffer
PROCinsert(A\$)	Inserts A\$ into input buffer
PROCexit	Final housekeeping before exiting from the program
PROCdir	Selects a new directory, saving entry point details so that highlight bar is correctly positioned following a subsequent command. Also maintains pathname to current entry
PROCupdir	'Climbs' up the tree to parent directory
PROCwait(T)	Waits for T seconds with 'wait' message on screen
PROCnd(N\$)	Switches context handles for new pathname N\$
PROCod	Returns to original directory and context handles
PROCdowndir(a\$)	Used by PROCdir to enter a new directory
PROCinstructions	Displays instructions in window on screen
PROCs	Sounds a beep
PROCboxon	Selects bottom window
PROCboxoff	Selects main window
PROCCerror	Deals with errors, and Escape exit from program
FNsj	TRUE if using SJ file server
FNname(S%)	Returns the name of directory entry S%, colour code indicates directory or file
FNas(ac%)	Returns the access string corresponding to ac%
FNatrib	Selects alternative access strings for SJ file servers
FNnewns(D\$)	Allows highlight bar to cross page/column boundaries
FNkeyclear	Waits until all keys are released
FNnamestrip(entry)	Removes colour byte and trailing spaces from entry names
FNpathname	Returns pathname of current directory
FNopen(\$osc)	Opens and returns the handle for directory \$osc
FNprivname	Returns name of current directory. Sets privilege variable.
FNowner(entry)	TRUE if owner access to entry

Procedures and functions used in the program

entry in the directory is reached. FNname prints each entry in a colour depending on whether it is a file or a directory.

The display makes use of different colours to signify different types of entry and access. These are chosen so they show up on monochrome monitors. You can experiment with them by altering the colour allocations at the beginning.

The program will allow you to explore any directory which is further down the tree structure than your starting point. So if you wish to explore the whole of a disc, you must start with the root directory \$ as

your currently selected directory when you run the program. The maximum level of directory nesting is arbitrarily set to 30 – if you ever need to delve deeper, you can increase the DIM values of path\$(30), S(30) and P(30).

May you have many happy hours searching for your files!

Turn to the yellow pages index on page 113 for details of the listings.

The proceedings of the Econet Conference are obtainable from ME Electronics, 5 Hatherley Road, Reading RG1 5QA. Tel: (0734) 669512. Price £3.

First-Class Utility Software & Printers from the Professionals.

CJE Micro's Unbeatable in print.

Multi-Font NLQ

("Very good package . . . Saved me over £100")

V. BUNCE, OXFORD. DEC 86.

Upgrade your printer to NLQ with a choice of many fonts. Up to 49 predefined fonts are available on 4 discs, or you can design your own. Multi-font is easy to use and compatible with nearly all software. For prices see below or ring for further details on 0903-213361.

Some of the fonts available are shown here:

This is STANDARD
This is COURIER
This is ITALIC
This is 800h3C
This is COMPTS
This is BOLD
This is SHADOW
This is OUTLINE
This is BROADWAY
This is THEATRE

CJE Welcome EXPORT and TRADE ORDERS - inquire for delivery costs.

Phone/Credit Card and Official Orders are accepted. Please ring for all the latest information and prices on 0903-213361.

FONTAID

("Good value . . . Useful buy")

BEEBUG MAY 87.

Fontaid is a must for any Canon or Kaga Taxan owner. 60 predefined fonts are available or you can design your own. A Star NL10/NX15 version is also now available, so inquire for further details.

"Impressed... Delightful Simplicity... Easy to use"

(MICRO USER JUNE 87)

INFORM from CJE Micro's.

This unique sideways RAM information system is quick, versatile and simple.

NOW - Solidisk 256K version is also available.

Master Writeprotect/ROM select switch.

"I cannot praise it enough . . . Worth buying!!" MICRONET 800116575

This switch system selects RAM protected, RAM unprotected or ROM. Each bank is separately switchable. This is the MOST POWERFUL switch unit available at only £15.00 inc VAT. (p & p £1.00 extra).

CJE micros

CJE Micro's (Dept AU10), 78 Brighton Road, Worthing, W. Sussex BN11 2EN. Tel: 0903-213361.

CJE Micro's are an official ACORN approved dealer.

A wide range of accessories and software for ACORN, Amstrad and Atari computers are on display in the CJE Micro's retail showrooms.

SOFTWARE PRICE LIST

All prices include VAT, but please add £1.00 for postage/packing and state 40, 80 track or 3½" ADFS when ordering.

MFNLQ £30.00
Font Discs B, C & D each £15.00

Fontaid £30.00
Fontaid with 6264 RAM £36.00
Font Discs A, B, C, D, EA & Lang each £15.00

Inform £20.00

PRINTERS

Delivery on all printers is free. Ring for a sample printout, specification and the latest prices.

The following Near Letter Quality printers all come with centronics interface, friction and tractor feed.

Panasonic KXP1081 £180.00
Canon PW1080A £270.00
Star NL10 £260.00
Star NX15 £410.00
Star NB24/10 (216cps) £599.00

Juki Daisywheel £330.00
Free delivery on printers

CJE Printer packs

The CJE packs include: Cable, delivery, paper, plug, utility software and booklet. Please ask for further details.

The Printer packs cost £15.00 with printer: e.g. NL10 + pack = £260 + £15 = £275 inc. VAT.

BBC Cable if purchased separately is £8.00. Software on its own: £11.00 + £1 p&p.

REVIEWS

games

THE GAMES PAGE

With the end of the cricket season, David Lawrence gives you the chance to keep in practice over the winter

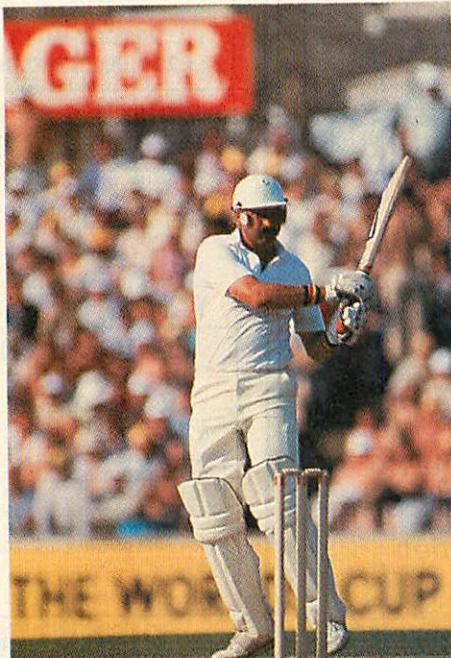
Pew, I'm glad the show's over for another year! Four days on the *Acorn User* stand is enough for anyone.

Superior Software was there showing off *Stryker's Run 2*, *Craze Rider* and the latest version of the Arc game *Zarch*, which is an enhanced version of *Lander*. *Zarch* is still quite a long way from completion. Superior says that production copies should be available by the end of the year. So, until then, we're stuck with *Lander* in the office.

The Audiogenic mob, Peter Scott and Gary Partis, could be found propping up the bar. After a suitable bribe (a game of *Lander*) they showed me what they were working on. Peter is writing *Ransack*, a cross between his usual puzzle-solving games and *Defender*. The game features large sprites and fast action. Meanwhile, Gary is finishing off the BBC micro version of *Impact*, an *Arkanoid*-type game, but with a few special features and extra screens. He has also persuaded Audiogenic product manager Darryl Still to buy him an Arc, so that he can start on *Impact* for that. He is working on *Leader Board* too.

Tynesoft's BBC conversion of *Spy vs. Spy* is a very accurate copy of the original Commodore 64 game, and although it is quite hard to get the hang of, is actually a very addictive and enjoyable game. This is especially true when you play against a friend. The idea is to explore a secret base and find the documents, a key, some money and a passport and then escape! But your plans can easily be thwarted by the other player as they can set booby traps on doors, behind pictures or in filing cabinets. This game can ruin friendships!

Tynesoft also is to release another sports simulation. This one is going to be called *Indosports* and features four events, namely table tennis, airball, ten-pin bowling and darts. There are also plans for a *Commando*-type game called *Saigon*. Both



Win Graham Gooch's bat

of these are scheduled to be available by the end of October.

According to Richard Hansen, Superior's plans include a game a month, at least until the end of the year. *Palace of Magic* – not *Castle of Magic* as mentioned last month – will be available in early September. *Palace* is really *Citadel 2*. It has lots of logical puzzles – for example, you must find the princess a present and give the vicar something. You must explore a forest, avoid the white rabbits and collect the magic hats. The layout of the game is very similar to *Citadel*, with over 100 graphically-detailed locations. *Palace* has been written by Martyn Howard, a newcomer to the BBC games scene.

It finally looks as though *Elixir* will also be released. This game has gone through three separate authors before eventually coming up to Superior's high standards. The final touches have come from Chris

Hyde, one-time author of *Zany Kong* and *Zany Kong Jnr*.

Superior is also working on another couple of game compilations. But instead of just old Superior games, they will be 'games that should have sold better from other companies'. Nothing definite yet, but there are some pretty good games on Richard Hansen's shortlist.

Apart from David Braben, who's writing *Zarch*, we know that Jonathan Griffiths (*Snapper*, *Rocket Raid* and *JCB Judder* – his words not mine!) and Kevin Edwards (*Galaforce*) are both working on Archimedes games. And was it really an Archimedes playing *Gauntlet* at the show?

As the nights are drawing in and the sound of leather on willow is lost for the winter, we thought we'd have a competition to cheer up you disconsolate cricket fans. This is to coincide with the Audiogenic's release of *Graham Gooch's Test Cricket*. The prize is a cricket bat, specially signed by the man himself. All we want to know are the answers to the following simple questions:

- What is Graham Gooch's highest score in test cricket?
- What was the total number of runs scored by Graham Gooch in his very first test match?
- Graham Gooch has played for both Essex and England, but which other first-class team has he played for?
- Three other English players made their test debuts during the same Ashes series as Graham Gooch. Name two of them.
- Against which country did Graham Gooch score his maiden test match century, and where?

First correct answer out of the hat on November 12 wins the bat. Send your answers to 'Graham Gooch Competition' *Acorn User*, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF. The editor's decision is final.

PRISMA 3™



High performance professional computer graphics for Animation, Research, Graphic Design, Image Analysis, Video, Television . . .

- Display resolution up to 1536×574 pixels
- 256 colours from a palette of 16.7 million
- Real-time image grab and manipulation
- Hardware window with programmable transparency
- Hardware smooth pan and zoom
- 2M byte buffer—well over four full screens
- Support for real time 2D animation
- Drawing at 900,000 pixels/sec
- Complex bitblt up to 30 million pixels/sec
- Broadcast specification digital genlock
- Control outputs—eg for video keying
- Video blanking input
- Facilities for real-time image analysis

PRISMA-3 is fully supported for use with the Acorn BBC model B and Master series computers, together with the range of co-processors, allowing programming through their standard graphics commands. Support for other machines is currently under development. All units are supplied with a comprehensive reference manual and demonstration diskette.

PRISMA-3s are also available at board level to systems integrators.

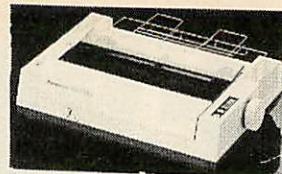
Millipede Electronic Graphics
Pryor Close, Milton, Cambridge. CB4 4BU
Telephone (0223) 862066

See us at

Stand 40
Acorn User Show
July

Stand 131
Computer Graphics '87.
October

PANASONIC KXP 1081



with BBC cable & paper
£169.00 (£146.96 + VAT)

Above with Screen Dump & 2m cable

£175.00 (£152.17 + VAT)

Exc VAT Inc VAT

KXP 1080 Fabric ink ribbon.....4.26 4.90

KXP 1080 View Printer driver ...8.65 9.95

KXP 1080 Control Dump rom 13.00 14.95

PANASONIC KXP1082

(as 1081 but 160cps)
with BBC cable & paper

£219.00 (£190.43 + VAT)

PANASONIC KXP3131

(17pcs Daisy Wheel)

with BBC cable & paper

£279.00 (£242.61 + VAT)

CANON PW1080A

with BBC cable & paper

£239.00 (£207.83 + VAT)

KAGA/TAXAN KP810

with BBC cable & paper

£239.00 (£207.83 + VAT)

STAR NL10

with BBC cable & paper

£209.00 (£181.74 + VAT)

KAGA/TAXAN KP815

with BBC cable & paper

£299.00 (£260.00 + VAT)

CITIZEN 120D

with BBC cable & paper

£169.00 (£146.96 + VAT)

EPSON LX80

with BBC cable & paper

£229.00 (£207.83 + VAT)

JUKI 6100

with BBC cable & paper

£299.00 (£260.00 + VAT)

VOLTAGE JOYSTICKS

Exc VAT Inc VAT

Delta 14B single11.26 12.95

Delta 3B single9.52 10.95

Delta 3B twin15.61 17.95

PRINTER ADDONS

Exc VAT Inc VAT

Universal Printer Stand.....	13.00	14.95
LX Tractor Unit.....	19.96	22.95
LX Sheet Feeder.....	47.83	55.00
LX Print Ribbon.....	3.00	3.45
FX10 Sheet Feeder.....	106.96	123.00
NL-10 Sheet Feeder.....	47.83	55.00
NL-10 Print Ribbon.....	4.80	5.52
120D Sheet Feeder.....	86.09	99.00
120D Print Ribbon.....	4.00	4.60
KP/PW Print Ribbon.....	3.39	3.90
Juki 6100 Dust Cover.....	5.60	6.44
Printer Dust Covers.....	4.00	4.60

PRINTERS/CABLES

Exc VAT Inc VAT

Epson EX800.....	404.35	465.00
Epson LQ800.....	469.00	539.35
Epson FX800.....	313.04	360.00
Epson FX1000.....	413.04	475.00
Juki 2200 Daisy.....	226.22	259.00
Juki 5520 Color.....	369.57	425.00
Kaga/Taxan KP910/15.....	350.00	402.00
MP165.....	169.57	195.00
1.5m (4foot) BBC cable.....	5.70	6.60
2.0m (6foot) BBC cable.....	7.74	8.90
Compact printer cable.....	7.74	8.90
IBM PC printer cable.....	9.57	11.00

EPROMS, 8271

Exc VAT Inc VAT

1-9 27128 250nS.....	3.83	4.40
10+ 27128 250nS.....	3.43	3.95
1-9 2764 250nS.....	3.00	3.45
10+ 2764 250nS.....	2.74	3.15
1-9 27256 250nS.....	4.22	4.85
10+ 27256 250nS.....	3.83	4.40
1-9 TTL/Cmos set.....	3.91	4.50
1-9 8271 controller.....	32.17	37.00
10+ 8271 controller.....	30.43	35.00
1-9 6264LP 150nS.....	2.56	2.95
Acorn 8271 DFS.....	41.74	48.00
Acorn ADFS Upgrade.....	25.22	29.00

ROMS

Exc VAT Inc VAT

Inter-Word37.39 43.00

Inter-Sheet36.52 42.00

Inter-Base48.70 56.00

Inter-Chart24.35 28.00

Wordwise Plus37.39 43.00

Spell Master40.87 47.00

ACP Disc Investigator.....22.61 26.00

ACP 1770 DFS ROM.....26.96 31.00

ACP Disc Toolkit.....26.96 31.00

View 2.133.91 39.00

ViewStore38.26 44.00

ViewSpell28.70 33.00

DISKETTES

(lifetime warranty)

Exc VAT Inc VAT

10 Banana Reversible disks.....	8.65	9.95
10 96tpi D/S D/D case.....	13.90	15.99
10 96tpi D/S D/D case.....	7.39	8.50
10 96tpi D/S D/D in box.....	6.52	7.50
50 96tpi D/S D/D in boxes	21.70	24.95
100 96tpi D/S D/D in boxes	31.13	45.00
50 Disc Box hinge lock.....	7.78	8.95
100 Disc Box hinge lock.....	8.65	9.95
Black Library case.....	1.21	1.39

DISC DRIVES

Exc VAT Inc VAT

Toshiba 400k 80T chassis.....	65.22	75.00
Toshiba 400k + case etc	82.61	95.00
Cumana CSX100.....	91.30	105.00
Cumana CSX400.....	124.35	143.00
Cumana CD800S.....	260.00	299.00
MD400A 400k No PSU	101.74	117.00
MD400B 400k & PSU.....	116.52	134.00
MD802C 800k No PSU	190.43	219.00
MD802E 800k & PSU.....	216.52	249.00
MD802D 800k + Stand	225.21	259.00
Phone for Viglen & Torch Winchesters		

MONITORS

Exc VAT Inc VAT

Philips CM8533.....	230.43	265.00
Philips CM8852.....	251.30	289.00
Philips BM7502 Green.....	68.70	79.00
Philips BM7522 Amber.....	73.91	85.00
Philips BM Tilt stand.....	7.78	8.95
Taxan KX P31 Green.....	77.39	89.00
Taxan KX Amber.....	86.09	99.00
Taxan Super Ver 625	317.39	365.00
Microvitec 1451	221.74	255.00
Microvitec 1451 Ap.....	260.00	299.00
14" Tilt/Swivel Stand.....	13.87	15.95

(Prices inc. BBC Cable)

MASTER/COMPACT

Exc VAT Inc VAT

Master 128K Micro	360.00	414.00
Master ET 128K Micro	338.00	388.70
512 Co-processor	185.00	212.75
Turbo Upgrade	98.78	113.50
Universal 2nd Pro	72.00	82.80
Acorn Z80 2nd Pro	317.39	365.00
Acorn Cartridges	10.87	12.50
Reference Manuals	14.00	14.00
Peartree Cartridges from	8.65	9.95
Care Cartridges from	7.83	9.00
View 3/View Sheet guides	9.00	9.00
ARM Assembler book	12.00	12.00
Understanding Interword	6.50	6.50
Master & BBC Dust Covers	3.00	3.45
Monochrome Compact	373.04	429.00
Second user BBC Bs available		

Phone for our best price before placing your order

EDUCATIONAL & GOVERNMENT ORDERS WELCOME

All products have a 12 month no quibble guarantee

Prices subject to variation without prior notification

We are closed all day Wednesday and Saturday afternoons

Carriage 92p (80p + VAT) Securicor £6.90 (£6.00 + VAT)

Acorn Dept.

128 West Street,

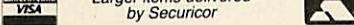
Portchester,

Hants.

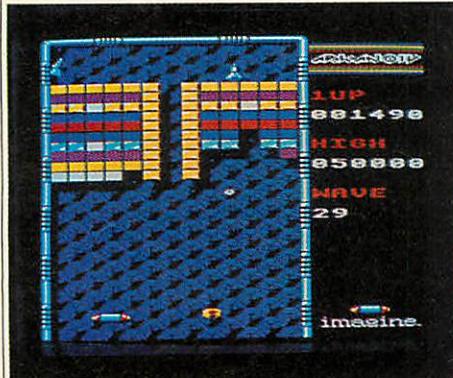
PO16 9XE.

Tel: 0705 325354

WeServe
Larger items delivered
by Securicor



BREAKOUT IS BACK



Arkanoid; *Imagine*; BBC B, Master, Compact; £9.95 (cassette), £12.95 (disc). *Arkanoid* is the old favourite *Breakout* brought bang up to date. You may have seen *Arkanoid* in the arcades – well, this is a near perfect conversion. As in *Breakout*, the idea is to bounce your ball (or energy bolt in this case) against the wall with your bat (they say it's a spacecraft) and knock out the bricks. This would be trivial if it were not for the descending aliens and the resilience of some bricks.

Aliens are destroyed if hit with a ball or bat, but divert your ball when it hits them.

There are eight colours of normal bricks plus silver and gold ones. Silver ones take two hits to destroy (more on later levels) while gold ones are indestructable!

The game starts off simply with a single straight wall of bricks but soon gets harder. The ball also speeds up alarmingly, making things very tricky.

Luckily, things aren't as nasty as they seem – some of the bricks when hit turn into capsules that drop down the screen. They take effect if you catch them, for instance the 'S' capsule slows the ball down and the 'C' lets you catch the ball.

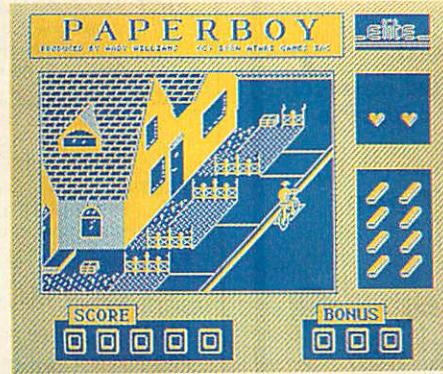
Graphically, the game is simple but good, although the score board could be improved. Stippled colours very effectively make up different shades for some of the bricks, and clever use is made of colour on the silver and gold bricks. The sound is also effectively used.

Points against the game are there is no sound-off key; the aliens often fly over the bricks; the ball often seems to go through the bat and there is no analogue control making rapid movements difficult.

Overall, the game is very addictive and well worth the money. It's especially nice seeing a BBC game using a full mode 2 screen with no colour changing!

David Lawrence

SACK THE PAPERBOY



Paperboy; Elite; BBC B, Electron; £9.95 (cassette), £14.95 (disc).

Paperboy is the computer version of the arcade hit, but not a very good one.

The idea of *Paperboy* is to cycle along the road and fling newspapers into mail boxes, while at the same time avoiding all manner of things including dogs, bouncing balls, old ladies, C5s, racing cars, gutters, graves and brick walls.

Your aim has to be quite good, and while you are sighting up, you tend not to notice the plant pot in front of you, or the C5 on collision course from a side-street; you don't have much time to think.

You gain bonus points for vandalising non-subscribers' houses with your papers. If you accidentally smash a subscriber's window, you lose all your bonuses.

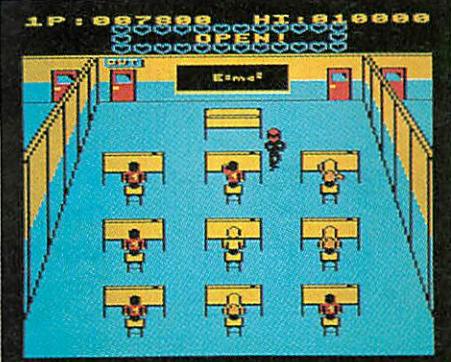
The 3D motion is very good, and Elite has overcome the problem of screen flickering very well. I'll give it originality marks for not giving a 'Game Over' message. Instead there's a newspaper with the headline: 'Get well soon paperboy!' Unfortunately half the screen is used up for your score and bonus marks.

At the end of each day's round, (if you complete it) you gain extra points by cycling round the track and making jumps over something totally unrecognisable.

The game is fun at first, but the more you play it, the more boring it becomes.

Sam Greenhill

IMAGINE ALL THE PROGRAMS



Konami Coin-op Hits; *Imagine*; BBC B; £9.99 (cassette).

In *Green Beret*, you are a 'highly trained combat machine', and your task is to rescue the captives held by the enemy. Your initial weapon is a knife, but by killing the Commandant, you collect other weapons, which you are advised to save until the end of the current stage, when you will be attacked by every enemy.

I have completed two stages, but haven't caught sight of the Commandant – only men who kick me in the face. It is hard to see yourself against the background, which makes fighting difficult. The scrolling is almost smooth, the sound effects reasonably realistic, but the game is quite dull.

The next game, *Mikie*, is a version of the arcade game in which you are the schoolboy collecting hearts in order to get a message to your girlfriend. It's an amusing game with simple, but reasonable, graphics. The keyboard is sometimes annoying, but *Mikie* is my favourite of the four.

Hyper Sports is another arcade follow-up, with *Chariots of Fire* as the loading tune. This is a very good game; the action is smooth, the graphics are good, and so is the sound, but after each event it has to load in the next one, which takes approximately five minutes. Then, if you fail that particular event, you are forced to rewind the tape and start all over again!

The last game is *Yie Ar Kung Fu*. This is good fun, and always seems to persuade me to have another go. You battle against 10 opponents, each with different abilities.

The whole package is good value, but there is room for improvement.

Sam Greenhill

RBRC SOFTWARE

- ◆ Hands on Experience in Business Dynamics.
- ◆ Live Business Simulations.
- ◆ The teams (as boards of directors) have to cope with all aspects of managing the business.



Crisis Management

Fothergale Co Ltd, makers of the 'Castaway' disposable shirts.

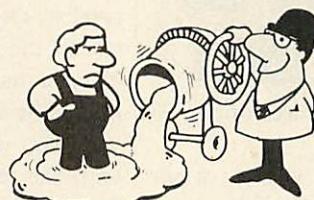
For sixth formers (16-19)
£60 + VAT p&p

The Cement Business Game

The Goliath Cement Co Ltd, a small independent cement maker coping with all its problems.

For fifth and sixth formers (15-18)
(Sponsored by Blue Circle Industries PLC)

£30 + VAT p&p



"Beat the BOSS"

An introduction to business dynamics, and to "Crisis Management". For fourth to sixth formers (14-17)
£30 + VAT p&p

All 80 track DFS for BBC/B, Master, Compact, 'Nimbus'.

"Crisis Management" has comprehensive tutor's manual that covers all three simulations. "Beat The BOSS" has a special tutor's guide. All three have players' guides

SPECIAL OFFER

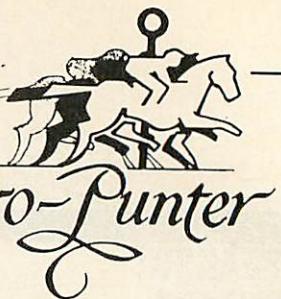
All three simulations for £98.50p plus VAT and p&p

Normal retail price for all three £120 plus VAT and p&p

Offer valid for all orders received by 7th December 1987

From: RBRC Software
Guild House
32 Worple Road
Wimbledon SW19 4EF

Telephone: 01-946 8641



INVEST WITH PRO-PUNTER

FACT: Intelligent INVESTMENT in horse-racing can make you very rich indeed. A skillfully-managed investment 'bank' can multiply very quickly.

FACT: So many 'mug' punters gamble rather than INVEST, such that there is a huge pool of funds which the intelligent investors can tap to make excellent profits.

FACT: Successful investment in racing has hitherto been very hard work, as knowing which horses to be "on" has usually required many hours of painstaking study. Successful investors have largely, until now, needed to be enthusiasts.

FACT: The sophisticated analysis needed to pin point profitable racing investments can be handled by an 'expert system' designed for your home micro: you do not need to be a racing expert or an enthusiast to partake in this highly profitable activity.

FACT: Such a system is now available from DGA SOFTWARE. It's called PRO-PUNTER. It uses information from the racing press and tells you which horses to back.

FACT: Impressive results from PRO-PUNTER are regularly being proofed to the racing press. Fourteen investment advices have produced eleven winners, representing a return on capital investment of 97%.

FACT? You will be richer this time next year than you are now.

PRO-PUNTER cost £57.50 including VAT, P&P. Orders and enquiries to DGA SOFTWARE, PO BOX 36, ASHTON-UNDER-LYNE, OL7 9AJ.

WITH PAYROLL A LOW COST DISC BASED PROFESSIONAL ACCOUNTING PROGRAM

For the BBC Computer

"Micro-Trader"

INTEGRATED SALES PURCHASE AND NOMINAL LEDGERS

Designed for business use by a business man. "Micro-Trader" offers full Sales and Purchase Ledger facilities including SALES INVOICE and STATEMENT PRINTING with a capacity of up to 1,000 accounts and 5,000 transactions per month.

Nominal Ledger features quick and easy entry of everyday transactions. Up to 6 Bank Accounts, full V.A.T. facilities, Journal Posting, Full Reporting for individual accounts, Audit Trail, Trial Balance, Profit & Loss and Balance Sheet.

"MICRO-STOCK"

Stock Control program, fully integrated with "Micro-Trader". 4,000 Stock Items with user defined Codes, Invoice and Credit Notes and Cash Sales routine. Full Stock Held Reports.

£75.00 + V.A.T.



"EXTENDED PAYROLL"

Micro-Aid Full Feature Extended Payroll. For use stand alone or integrated with "Micro-Trader".

£49.95 + V.A.T.

"MICRO-MAILER"

A Mailmerge program, fully integrated with "Micro-Trader". With a user Database.

£30.00 + V.A.T.



BRITISH BROADCASTING CORPORATION
MASTER SERIES MICROCOMPUTER

Archimedes

PHONE TODAY FOR A FREE FACT SHEET

MEADOW COMPUTERS

11, LONDON STREET, WHITCHURCH, HAMPSHIRE, RG28 7LH

Telephone: Whitchurch (0256) 892008

SOFTWARE

UNDER STARTER'S ORDERS

And they're off! Michael Leete picks up some betting tips from DGA Software's *Pro-Punter*

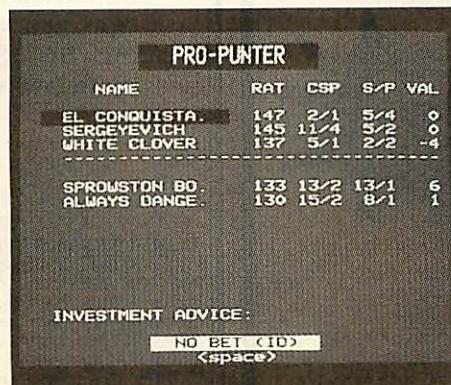
In its admittedly small field, *Pro-Punter* from DGA Software may well be a new front-runner. This horse race betting package is very well presented, with attractive screen displays and a concise and literate instruction manual. To the newcomer to racing, the program is considerably more helpful than the pages of *The Sporting Life*, which is one indispensable source of the required data. For example, the data is entered in five distinct stages. At the end of stage four, when both the user and *The Sporting Life* may be showing signs of wear and tear, a friendly message 'Nearly there...' appears on the screen.

Entering the data will take at least half an hour, so going through the race card is not really practical. The true skill lies in picking races, usually with only a few runners, in which analysis will be meaningful because the statistical information is abundant. After the input stages, the program will take several minutes to make its calculations – possibly as much as half an hour with a field as large as the Grand National – before listing up to 12 horses in their forecast order of finishing.

You then enter the starting prices for each horse, and the value of the odds offered on a scale ranging from 'Good Value' to 'Inflated' (a sure sign of a no-hoper) appear on screen. Finally, the program tells you whether to bet, giving coded reasons for the decision.

How the program processes the information and what weight it gives to each element is, of course, a secret, though the results suggest a far better system than sticking an electronic pin in the race card. At the time of writing, the program had forecast 34 winners in 43 races. Level £10 stakes (tax paid) on these forecasts would have netted a profit of £287.24 and the cash flow would have more than covered the cost of *Pro-Punter* after the first eight selections. Selections over a far longer period are claimed to have produced similarly profitable results. All this seems too good to be true, so let's examine the snags.

The first hurdle is cost – £57.50. In racing terms, such a sum would purchase



Pro-Punter advises caution in this race

about two-thirds of a pair of race-going brogues or five £10 bets in a betting shop and a fish and chip supper. It also represents the fee for about a dozen selections from a professional tipster. Therefore, viewed as the initial investment in a profitable enterprise, the cost does not seem excessive and as *Pro-Punter* processes new information for every race, there is no reason why it should not serve as an 'adviser' indefinitely. There is also considerable satisfaction in being able to analyse the form of any race at any meeting even if, at the end of it all, the program advises against making a bet.

Snag two is that the program is less robust than it might be. Certainly the review copy went into a trance a few times. However, with the help of a screen instruction which appears if any fault is detected, the data was not lost and recovery was fairly painless.

Users are advised to turn off all surplus ROMs to avoid conflict with the protection mechanisms and, no doubt, improvements will be made (some changes were in progress at the time of writing). At all stages disc access is frequent and, if the filing system and drive unit are not in mid-season form, corruptions may occur. However, due to the separate stages of input, it is usually possible to back-track one stage and to continue as before without losing the fruit of your labours.

Snag three is that this is definitely not a program with which to occupy an idle half hour. Successive screens and menus lead

the user carefully through the input stages but familiarity with the racing press is more difficult to acquire. One simple solution to this problem is to spend a few minutes in a betting shop talking to complete strangers, whose fluency in interpreting the printed data is quite amazing. They are probably all closely related to those mental giants who can work out darts scores and calculate three throws to win in split microseconds.

The alternative is to find a friend in the know. The friendly consultant for this review not only knew most of the answers, he was also the inventor of a racing system which works so well that, half-way through the second afternoon of its functioning trials, Ladbrokes refused to accept any more bets. The conclusion seems to be that, if the punter, with or without the help of a micro, is prepared to do the work, there is an arithmetical element in horse racing which can be harnessed to some considerable success.

The final snag is that *Pro-Punter* may become addictive. The statement in the House of Lords by Lord Wyatt, Tote chairman, that: 'People are seldom more honestly occupied than when placing bets on horses' would not meet with universal approval, and addictive betting is socially bad news – but to be fair, addictive winning is widely acceptable.

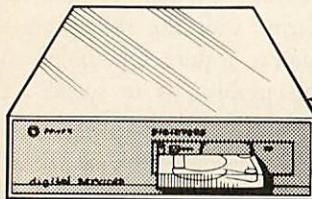
However, the point is that *Pro-Punter* is cautious and selective. For those who enjoy an occasional flutter on the classics, their frequency of betting might be increased by the program, but rigidly following the advice given, their frequency of losing should diminish. Of course, it is tremendous fun to pick a winner in the Derby because its name strikes some chord. It is not quite so much fun when the wretched animal staggers over the finishing post a poor last.

Pro-Punter is available from DGA Software, PO Box 36, Ashton-under-Lyne, Lancashire OL7 9AJ. Cost £57.50 including VAT and postage. Runs on BBC B and Master with single or double drives. Needs Basic 2 or higher.

ECONET ENHANCEMENT HARDWARE FROM DSL



ECONET TAPE STREAMER



£1,299
plus VAT

Back up your entire Econet Level 3 Winchester in 2 minutes!

The Digistore 600 is the latest addition to our range of Econet enhancement products. It provides Acorn hard disc users with the first professional tapestreamer for Econet and ADFS, and at 5.2 megabytes per minute, a security backup can be made several times a day with almost no effort.

The Digistore uses industry standard data cartridges giving exceptional reliability and data security.

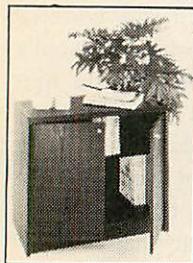
159 HAVANT ROAD, DRAYTON, PORTSMOUTH, HANTS PO6 2AA
TELEPHONE (0705) 324934

digital services

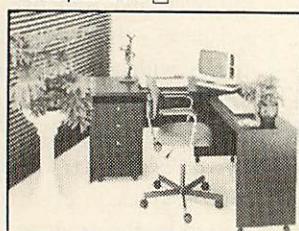


Elliot James Collection

Filing Cupboard £49.95 plus V.A.T.



Two Part Desk (Filing Cabinet extra)
£79.95 plus V.A.T.



Send to: EJC Ltd., St. Andrews House,
22/28 High Street, Epsom, Surrey KT19 8AH

Please supply the item(s) indicated.
I enclose a cheque/P.O. made payable to EJC Ltd. for £ _____
Please debit my Access/Visa Card No. _____



Amount £ _____ Signature _____

Card Expiry Date _____

Name _____

Address _____

Daytime telephone No. _____

Working furniture you can live with

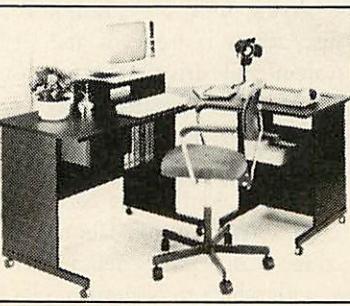
The Elliot James Collection is a complete range of High-quality self-assembly furniture finished in Black foil or Black Ash (according to product) designed for small business and office-at-home use. To order please tick the appropriate box and detach and post the complete advertisement to EJC Ltd or telephone 03727 42055.

All prices are exclusive of V.A.T. but inclusive of delivery to any destination in Mainland U.K.

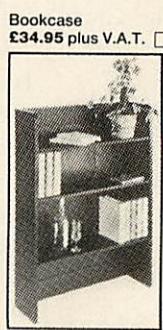
*Data Trolley
£54.95 plus V.A.T.

*Data File
£31.50 plus V.A.T.

*Black foil finish remainder Black Ash



*Computer Workstation £129.95 Plus V.A.T.



Bookcase
£34.95 plus V.A.T.



Mobile Filing Unit £49.95 plus V.A.T.

VERY HIGH QUALITY VERY LOW PRICES

5.25" COMPUTER DISKS - BULK PACKED - TOP QUALITY

QTY	SS 48TPI	SS 96TPI	DS 48TPI	DS 96TPI	DS 48 C/R	DS 96 C/R
10	£5.95	£6.95	£6.95	£7.95	£8.95	£9.95
25	£10.99	£11.99	£11.99	£12.99	£14.99	£17.99
50	£19.99	£20.99	£20.99	£21.99	£27.99	£32.99
100	£36.99	£37.99	£37.99	£41.99	£45.99	£57.99
150	£52.99	£55.99	£55.99	£57.99	£63.99	£80.99
250	£85.99	£87.99	£87.99	£91.99	£103.99	£126.99

C/R = Coloured or reversible disks - reversible disks have two holes and two notches!

Boxes of 10 disks are supplied in plastic cases (worth £1.49).
These disks are packed with a protective jacket (envelope) and come with a full user set, including a label and a write protect tab. The disks are manufactured to top international standards and have a hub ring for added protection.

5.25" COMPUTER DISKS - BULK PACKED - with labels etc . . .

QTY	SS 135TPI	DS 135TPI
10	£14.95	£16.95
25	£29.95	£35.95
50	£55.95	£62.95
100	£105.95	£119.95
150	£149.95	£169.95
250	£239.95	£269.95

STORAGE BOXES

THESE ARE THE RANGES

Lockable Storage Boxes from Centec	£9.95
3.00" Lockable - Holds 60	£9.95
3.50" Lockable - Holds 40	£7.99
5.25" Lockable - Holds 90	£9.95
5.25" Lockable - Holds 50	£7.99
5.25" Lockable - Holds 100	£9.95

COMPUTER MONITORS - FULL RANGE STOCKED - BEST PRICES!

Philips CM 8533/CM 8833 - Colour Monitor IRGB for Nimbus/BBC etc	£269.95
Philips CM 8852 - Colour/RGB/TTL/Linear Inputs	£299.95
Philips BM 7502 - High Res Green Screen Monitor - Composite	£73.95
Philips BM 7522 - High Res Amber Screen Monitor - Composite	£89.95
Philips BM 7542 - High Res White Screen Monitor - Composite	£89.95
Microvitec 1431 - Standard Resolution Colour Monitor	£179.95
Microvitec 1451 - Medium Resolution Colour Monitor	£229.95
Microvitec 1441 - High Resolution Colour Monitor	£379.95

REMEMBER - All Monitors are delivered free by Securicor! No extras to pay!

CENTEC ELECTRONIC SYSTEMS LTD

UNIT 3, THE METRO CENTRE
BRIDGE ROAD, ORPINGTON
KENT BR5 2BE



TEL: (0689) 61947/62103 (24 hours)

Remember - all prices include VAT and delivery!
There are no hidden extras to pay!

Filing Cupboard £49.95 plus V.A.T.

Two Part Desk (Filing Cabinet extra)
£79.95 plus V.A.T.

*Data Trolley
£54.95 plus V.A.T.

*Data File
£31.50 plus V.A.T.

Bookcase
£34.95 plus V.A.T.

Mobile Filing Unit £49.95 plus V.A.T.

Working furniture you can live with

The Elliot James Collection is a complete range of High-quality self-assembly furniture finished in Black foil or Black Ash (according to product) designed for small business and office-at-home use. To order please tick the appropriate box and detach and post the complete advertisement to EJC Ltd or telephone 03727 42055.

All prices are exclusive of V.A.T. but inclusive of delivery to any destination in Mainland U.K.

*Data Trolley
£54.95 plus V.A.T.

*Data File
£31.50 plus V.A.T.

*Black foil finish remainder Black Ash

Computer Workstation £129.95 Plus V.A.T.

Mobile Filing Unit £49.95 plus V.A.T.

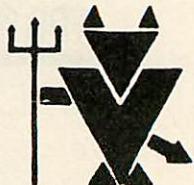
FROM

DATAPHONE LTD.



THE
MODEM
PEOPLE

The DEMON II modem



PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting the apparatus.

AUTO DIAL

AUTO BAUD

AUTO ANSWER

for ONLY £79.95 + vat

- * **V21 & V23 Speeds**
- * **Front Panel MAINS SWITCH**
- * **3 Metre Telephone Lead**
- * **Built In Power Supply**

- * **25 Pin D Socket**
- * **6 LED Indicators**
- * **Custom Moulded Case**
- * **Fitted Mains Plug**

The DEMON 2 is a completely new product, totally redesigned with experience from the original DEMON. It now has a full ANTI TINKLE circuit so that it can be approved for dialling. The case is specially made and is strong enough to stand on, let alone support your disc drives. As clients have requested, there is a mains switch and it's on the front panel. The unit has been to a BABT test lab for preinspection and is now awaiting BABT for full testing and approval, meanwhile we are obliged to point out that it is PROHIBITED from direct or indirect connection to public telecommunication systems. Action may be taken against anyone so connecting it.

Pre Approval Offer

FREE Disc Connect

FREE Computer Lead

Please note: We also stock approved modems i.e. MAGIC, ENTERPRISE & LINNET

DISC - CONNECT

The easiest way to use a modem from a BBC

- * Auto dials voice and data lines
- * Sets Modem baud rates on Demon
- * Auto redial of engaged Data number
- * Call timing

- * 300 Number store with FULL LOGON SEQUENCE
- * Displays details of speed, hours of operation.
- * Number selection by cursor, code or joystick
- * Works in conjunction with most comms Roms.

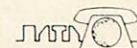
For just £9.95 + VAT

TO:

DATAPHONE LTD.

Prestel Mbx. 733230240

Telecom Gold Mbx. 72:MAG95608



THE
MODEM
PEOPLE

22 Alfric Square, Woodston, Peterborough, PE2 0JP Telephone (0733) 230240

Please send me:

- (Qty) DEMON II Modems @
- (Qty) DEMON Modems @
- (Qty) Enterprise 1 Modem @
- (Qty) Disc-Connect @

£96.54
£73.50
£119.54
£11.50

.... (Qty) DESIGNER Modem @
.... (Qty) Magic Modems (STD) @
.... (Qty) Pace Linnet Modem @
.... (Qty) Z Rom (inc. D.C.) @

inc. VAT & P&P
£119.54
£91.00
£149.50
£24.00

Please enclose cheque or Access/Barclaycard No to the value of £..... and include full address

MUSIC AT THE TOUCH OF A KEY

The new music package from Hybrid provides a highly sophisticated synthesiser.

David Johnson-Davies calls the tune

The Music 4000 keyboard is the latest component of the Hybrid Music System. It complements the versatile Music 5000 synthesiser, which uses a system known as Ample for music notation and control.

In the Music 5000 you enter music from the computer keyboard either in stave notation, with the *Staff Editor* program, or alternatively in the Ample program's own compact notation, devised by Hybrid for representing multi-part music and sounds, and into which every composition is ultimately converted.

The new Music 4000 keyboard is a far more natural and convenient way of writing music. You can now enter notes in real-time, directly from the keyboard. By means of some clever software, the end result is converted to exactly the same Ample notation used by the other Music 5000 programs, so that it can easily be integrated into larger Ample compositions, or edited with other Music 5000 programs like the *Staff Editor*, the *Mixing Desk* or the *Notepad*.

The Music 4000 is a four-octave piano-style keyboard with a good feel compared to some of the cheaper synthesisers currently on sale. It plugs into the micro's user port, and is supplied with new software which replaces the original Music 5000 disc. This new software adds recently launched programs to the main menu: *Keyboard* and *Recorder*. It also contains improved versions of the existing programs, enabling it to be used as a music input device.

All the programs are very easy to use, and have the usual convenient Music 5000 user interface, where most parameters are altered with the cursor keys and the Shift key; you seldom have to type in numbers, or even remember what the valid range of inputs is.

Many musicians may consider that the sounds available from the Music 4000 and 5000, quite apart from the music composition facilities they provide, will justify their purchase. The *Keyboard* program lets you play on the keyboard, and at the same time it gives you control over the choice of



The basic Hybrid Music System with the new Music 4000 keyboard

instrument, and several other aspects of the sound not found on more conventional types of synthesisers.

Two example files supplied with the software give menus of 90 or so pre-defined instruments, covering just about everything you would find on a synthesiser. The first of these example files, called 'general sounds', includes some good standard instruments, like a cinema organ, a more church-like organ, strings, a harpsichord, and one of the best electronic imitations of a piano that I have heard. There are also percussive sounds, like drum and cymbal, and some more complex sounds such as a complete orchestra, reminiscent of the symphonic sound at the beginning of *Sergeant Pepper's*, several synthesiser and Moog sounds, and a vocoder sound like a human voice.

The second example file which is supplied, called 'special sounds', adds some more extraordinary effects including explosion sounds, and others best described as atmospheric. Although it's fun trying to guess what some of the more exotic sounds are from their abbreviated titles, it is a pity that Hybrid does not give a full list with

more detailed explanations in the manual.

Having selected an instrument from the menu on the screen, you can play polyphonic music on that instrument. The number of notes that can be played simultaneously depends on the complexity of the instrument. Most instruments use two of the 16 channels, which means that up to eight voices can be played at once – a chord of eight notes can be sounded. The most complex sounds use all 16 voices, so if one of these instruments is selected only one note can be sounded at once. The keyboard comes with a foot switch which acts as a sustain pedal. For playing percussive instruments, the best effect is obtained by holding the pedal down so that all notes are sustained; a short lift of the foot pedal then acts as a damper.

If the pre-defined instruments do not give you quite the sound you want, you can edit and modify any of the definitions to create your own new instrument. The facility is the same as in the Music 5000 system, with the added advantage that you can now use the full range of the keyboard to try the sound you are designing. The keyboard interface provides six controls in

POOLSWINNER II

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolwinner is a sophisticated Pools prediction aid. It comes complete with the largest database available - 22000 matches over 10 years.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolwinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **LEAGUE AND NON-LEAGUE** All English and Scottish League teams are supported, and also the non-league sides often used on pools coupons.
- **PRINTER SUPPORT** Full hard copy printout of data if you have a printer.



PRICE £15.00 (all inclusive)

NOW
AVAILABLE

FIXGEN

8/8

AT LAST: No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish League fixtures for 1987/8. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolwinner. Yearly updates available.

POOLSWINNER with FIXGEN £16.50 (for both)



COURSEWINNER V3

THE PUNTERS COMPUTER PROGRAM

You can develop and test your own unique winning system by adjusting the analysis formula, or use the program in simple mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, prize money, weight, going, trainer and jockey form etc, etc. It outputs most likely winners, good long odds bets, forecasts, trifectas etc. The database includes vital course statistics for all British courses. You can update the database - never goes out of date. **FULL PRINTER SUPPORT**.

PRICE £15.00 (all inclusive) includes Flat AND National Hunt versions.

ALL PROGRAMS AVAILABLE FOR: AMSTRAD CPCs, AMSTRAD PCWs, PC1512, All BBCs, All SPECTRUMS, COMMODORE 64/128.

Supplied on tape (automatic conversion to disc) - except PCW and PC1512 (on disc - add £3.00).

Send Cheques/POs for return of post service to ...



phone 24 hrs

selec

SOFTWARE



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE SK8 2HX. 061-428 7425

(Send for full list of our software)

CommunITel

CommunITel is an exciting professional viewdata system for the BBC B, Master & Compact Micros (DFS, ADFS or Network).

IT'S USES IN EDUCATION INCLUDE

Learning Information Technology
Structuring Creative Learning
Cross-Curricular Development
Administration / Publicity

The system includes a comprehensive suite of programs which enables the creation of a database with message facilities. This can then be made available to callers using a telephone line and any viewdata terminal. The package includes comprehensive tutorial and reference manuals and a sample database.

Available in TWO LEVELs FOR USE WITH THE DTI (DaCom or Tandata)
SCHOOLS MODEM

LEVEL 1+ FRAME EDITOR
SEARCH
CAROUSEL DISPLAY
FRAME PRINTER
VIEWDATA - TERMINAL

LEVEL 2 FRAME EDITOR
SEARCH
CAROUSEL DISPLAY
FRAME PRINTER
VIEWDATA - TERMINAL
DIAL IN HOST SYSTEM
TELESOFTWARE FORMATTER

LEVEL 1+ £55

LEVEL 2 £95

Upgrade from LEVEL 1+ TO LEVEL 2 £45
LEVEL 2 TO ADFS LEVEL 2 £45

LEVEL 2 with Auto-answer / Auto-dial MODEM from £375
(all prices exclude p. p. & VAT)

Educational Discounts Available

The ADFS version includes response frames and gives up to 600 pages with a single 80 track D.S. disk or thousands of pages using a Winchester disc drive.

FOR A DEMONSTRATION OF LEVEL 2 dial :

Viewdata No. 01-968 7402 or Telephone 01-960 7998

189 FRETON ROAD, LONDON W10 6TH

REFLECT ON IT...

IsTInumm09

C & F ASSOCIATES

Quality Service at Competitive Prices

CASS DISC COMP

		ELITE				Oxbridge				SUPERIOR				
ADDICTIVE			Paper Boy	7.75	12.95	-	Jet Set Willy	6.75	-	-	Palace of Magic	7.75	10.95	12.95
Football Manager	2.99	-	Airwolf	7.50	12.95	-	Jet Set Willy 2	6.50	-	-	Crazy Rider	7.75	10.95	12.95
ALTERNATIVE			FIREFIRE				The Big KO	6.75	-	-	Codenome Droid	7.75	10.95	12.95
Video Pinball	1.99	-	Star Drifter	1.99	-	-	Future Shock	6.75	-	-	Around the World	5.95	6.75	7.75
Red Arrows	1.99	-	Sentinel	7.75	12.95	-	Goal	6.75	-	-	Strykers Run	7.75	10.95	12.95
ASL			Cholo	-	15.95	-	US GOLD				Superior Collection 1	7.75	10.95	12.95
Omega Orb	6.75	10.95	-				Spy Hunter	7.75	-	-	Superior Collection 2	7.75	10.95	12.95
Graham Gooch	7.75	10.95					Impossible Mission	7.20	12.95	-	Grand Prix Construction	7.75	10.95	12.95
Thunderstruck	6.75	10.95					Crystal Castle	7.75	12.95	-	Ravenskull	7.75	10.95	12.95
Thunderstruck 2	6.75	10.95					Unbelievable Ultimate	7.75	-	-	Speech	7.50	10.95	12.95
Sphere of Destiny	6.75	10.95					ROBICO				Citadel	7.50	10.95	12.95
Power Pack	7.75	-					The Hunt	7.95	10.95	-	Repton 3	7.75	10.95	12.95
BUBBLE BUS			Arkanoid	7.20	-		Rick Hanson	7.95	10.95	-	Acornsoft Hits 1	7.75	10.95	12.95
Starquake	7.75	10.95					Project Thesius	7.95	10.95	-	Acornsoft Hits 2	7.75	10.95	12.95
BUG-BYTE			Konami's Coin-Op. Hits	7.75	-		Myorem	7.95	10.95	-	Elite	10.95	12.95	17.50
Dunjunz	2.95	6.95					Rick Hanson Trilogy	18.95	19.95	-	Revs	10.95	12.95	17.50
Plan B	2.95	-	Yie Ar Kung Fu 2	7.20	-		Island of Xaan	7.95	10.95	-				
Bug-Byte Compendium	-	6.95	Mikie	6.95	-		Banjax	2.95	4.95	-				
CDS			INCENTIVE				Beeline	2.95	4.95	-				
Colossus Chess 4	7.75	12.95					Enthar 7	-	14.95	-				
Steve Davis Snooker	6.95	10.95	Graphic Adventure Creator	19.95	22.95	-								
Brian Clough Football	12.95	15.95	Adventure Creator	12.95	-									
Fortune			Ket Trilogy	7.75	10.95	-								
DATABASE			LEISURE GENIUS											
Mini Office 2	12.45	14.95	Scrabble	10.95	12.95	-								
Mini Office 2 (MASTER 80T)	-	17.50	Monopoly	10.95	12.95	-								
French On The Run	7.75	-	LOGOTRON											
DESIGN PEOPLE			XOR	7.75	10.95	-								
Sink The Bismarck	-	9.95	XOR Designer	-	12.95	-								
Tanks!	-	10.95	LOTHLORIAN											
Battle of Britain	7.75	10.95	Roundheads	-	10.95	-								
DOMARK			MICRO-POWER											
Trivial Pursuit	12.95	17.50	Micro-Power Magic	6.75	6.75	-								
DR. SOFT			Micro-Power Magic 2	6.75	6.75	-								
Phantom Combat	7.50	10.95	Imogen	7.20	7.75	10.95								
ELECTRIC DREAMS			TYNESOFT											
Firetrack	7.75	12.95	Spy Vs. Spy	7.75	12.95	-								
			Phantom	6.75	10.95	-								
			Mousetrap	6.75	-	10.95								
			Winter Olympics	6.50	-	10.95								
			Ian Botham	6.50	-	10.95								

ALL PRICES INCLUDE VAT AND POSTAGE & PACKING

(Overseas Orders add £1.00 per order or Airmail £2.00 per item)

Cheques/PO payable to:



C & F ASSOCIATES



and send to

C & F ASSOCIATES (AU) CRANFORD HOUSE,
WOOLSTERY, BIDEFORD, N. DEVON EX39 5QW

Telephone: (023 73) 619

Orders normally despatched within 24 hours of receipt but allow maximum of 7 days
For our comprehensive range of BBC and Electron Programmes please send for list

HARDWARE

addition to the choice of instrument. These allow you to alter the effects created by the keyboard. And you can transpose the pitch of the whole keyboard up or down in units of a semitone.

A parameter allowing some quite unusual effects is Scale, which sets the pitch scale in 16th-semitone units. For example, setting Scale to -16 reverses the whole keyboard, putting the highest notes at the bottom; playing a familiar tune, by touch, on a reversed keyboard is quite thought-provoking. Setting Scale to eight gives a quarter-tone scale, allowing experiments in achromatic sounds.

Control of the stereo position of successive voices is provided by the Spread parameter, which takes two numbers, the position of the first voice, and the offset for each successive voice. For example, setting it to -3 1 spreads the eight voices from left to right across the stereo field.

The Split parameter is used for playing multi-instrument tunes, and allows each white key to be used to play a particular voice, rather than a different pitch.

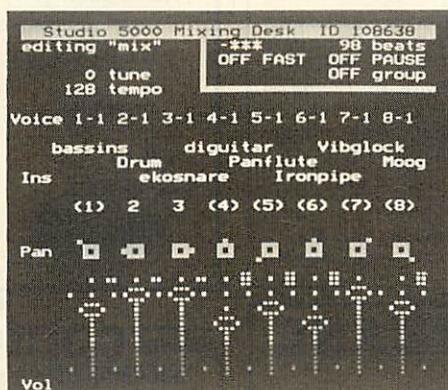
Single-key chords

Perhaps the most interesting controls are Reduce and Expand. These can be used in conjunction to create arpeggios, chords, echos and other effects with a single key.

To program one of these effects you first switch the Expand parameter to 'on.' The function of the foot switch then changes. With the foot switch pressed you play a sequence or group of notes to specify the effect you want. Then, with the foot switch released, each note on the keyboard will produce the specified pattern, transposed by that note's position.

For example, by playing a chord with the foot switch held down, the transposed chord is played for every note on the keyboard. Alternatively, typing a sequence (of up to eight notes) will cause that sequence to be played as an arpeggio for every note you play, transposed by the position of that note.

The Reduce control causes the volume of the successive voices to be reduced, giving echo effects. For example, programming Expand with the same note repeated eight times and setting Reduce gives an echo effect, which can be spread over the stereo field with Split. Used creatively, the Reduce



Final mix-down of a recording

and Expand controls enable a one-finger pianist like myself to create an extremely impressive sound.

Playing music on the keyboard, in synthesiser fashion, is just the beginning. The keyboard is fully integrated with the other Music 5000 modules, and can be used as a means of entering and composing multi-part music. The music you create is stored internally in a universal notation used by all Music 5000 modules, and can be displayed and edited in staff notation, or in Ample's pure note letter notation. Furthermore, compositions created using the keyboard can be mixed in the *Mixing Desk* program.

The recorder comes complete with two pre-defined mixes, which can be used as a starting point for creating a composition. The advanced mix assigns six two-voice instruments to six players.

The recorder gives a metronome beat through the BBC micro's loudspeaker as a timing signal for playing a tune. You can either practise, using the Perform option, or record a part with the Record option. You then have the option of selecting 'Play original', which plays it back as you played it, or 'Play final', which adjusts the timing of what you played to the most likely whole time intervals. You can adjust this rounding effect with the Quantum setting, which is the smallest interval that will be represented in the final piece of music, but by making it too small you run the danger of getting a very complicated representation of what you probably intended to be a much simpler piece of music.

Having entered one part, it is converted into Ample notation and stored using a Make command (by pressing a function key). You can then record another part while listening to the parts you have pre-

viously recorded, just like multi-tracking in a studio. There are also several features which will appeal to those, like me, whose ambitions exceed their talent: you can record at a slow tempo and play back faster, and you can edit mistakes in any part or record a part in small sections for subsequent combination.

Ample notation

Because compositions built up part by part are converted internally to Ample notation, you can load the composition into the *Staff Editor* or *Notepad* at any time, and edit what you have composed using their respective facilities.

The Music 4000 keyboard can also be used to input notes to the *Staff Editor* and *Notepad*. In the *Staff Editor*, notes played on the music keyboard are sounded, and simultaneously appear in conventional music notation on the stave. The system even allows you to enter chords, which are displayed in the usual exploded way on the stave. The foot pedal is used for entering rests, or, if pressed simultaneously with a note, to lengthen its duration. Seeing the results of playing a keyboard instantly in staff notation must be one of the best ways of appreciating the meaning of conventional music notation.

With the addition of the Music 4000 keyboard it is possible to create music with very little knowledge, either of music notation, or of Ample notation, and I would recommend it to budding composers and musicians, or to any music lovers interested in exploring the many varied possibilities of music composition.

Despite the ease with which you can get started and create simple compositions, it is reassuring to know that the whole system is capable of the sort of performance that would easily satisfy a professional music maker, and I look forward to seeing the Hybrid Music System in the credits of more professional compositions.

The Music 4000 and Music 5000 together cost £330 inclusive; the Music 4000 alone (for existing owners of the Music 5000) is £169. Available from Hybrid Technology Limited, Unit 3, Robert Davies Court, Nuffield Road, Cambridge, CB4 1TP. A special amplifier, the Music 1000, is also available, and a Music 2000 MIDI interface has just been released.

COMPUTECK

Some Points of Interest

A business has to make a profit to survive and you, the customer provide that profit to keep that business trading. Out of that profit comes lots of costs and usually a large one is advertising. We at Computeck keep our advertisements small and running costs to a minimum, then we can pass these savings on to you by way of discounts, as much as 20% on some items.

At present we have 800 plus items on our lists of new and used hardware and software. We trade in software and hardware for new items. So send a SAE today for our up to the minute prices from an Archimedes to a Ram Chip we have it all - Minerva Systems, Pace, Computer Concepts, AMS, Beebug, ACP, Taxan, Vine Micros, etc. etc. We are also registered Acorn Dealers.

So if the above makes sense to you, buy from us and we will be able to pass on bigger and bigger savings to you.

Due to large stocks - 10 tape based games £12.95 + £1.50 p&p.

Telephone 04574 65953 ACCESS and VISA accepted.

Computeck (Dept AU) : 2 Werneth Road : Glossop : Derbyshire : SK13 9LZ

WARNING! Anyone sending "pirated" software on any media will be reported to the software house or author for legal action by them!

RAYCOMP DATABASE

NEW PRODUCTS

Features: * 80 column display, up to 64 fields per record and 254 characters per field
• merge records with other files
• produce VIEW compatible files
• updated file information in header
• file size limited only by disc
• versions for Shadow RAM/6502 second processors (+ turbo), Sideways RAM COMPATIBLE versions for ALL Acorn microcomputers. This is the completely upgradeable database. DFS & ADFS versions. DFS-ADFS file transfer service. Shadow RAM/6502 sec. proc. & Sideways RAM versions £8.50. Basic ELK & BBC versions £8.00. Additional versions (not Archimedes) - £4.50. Archimedes version 1 (RISC) - £14.40.

RAYCOMP GRAPHICS UTILITY

Plot line or scatter graphs, pie or bar charts with data from RAYCOMP DATABASE files or from keyboard. With screen dump printout. Price £7.50

EDUCATIONAL - CHROMOTOGRAHY SIMULATION

Input sample size and number, number of theoretical plates, fraction size & number. Visual simulation, tabulation & graphical output. Suitable HNC/D, Degree courses in Chemistry, Biology & related subjects. Price £14.50

Orders/Enquiries: State full details of computer system, 40/80 track, DFS/ADFS to:

RAYCOMP, 46 Frenchs Avenue, Dunstable, Bed's LU6 1BH

MAKE YOUR MICRO EARN!

Yes, making money becomes incidental when you know how. Your micro is, if only you knew it, a gold mine, the size and make is irrelevant.

Make the initial effort NOW by starting your own

HOME BASE BUSINESS

Remember: You'll never get rich digging someone else's "ditch".

It's more rewarding than playing games.

The benefits are many and varied. Full or part time, for FREE details S.A.E. to,



HOME BASED BUSINESS

97 Pilton Place (AU7)
King and Queen Street
Walworth, London SE17 1DR

COMPUTEX

contex

BANK MANAGER is the most advanced and versatile personal bank account program for all BBC computers. "Data entry is a delight... professional... excellent product" Micro User. 36 separate accounts, 9999 standing orders, 99 analysis codes, thousands of transactions, budgets, graphics, foreign currency support, screen and printed reports, report writer, password, recovery and much much more. STANDARD BANK MANAGER for the BBC and BBC+, disc only £17.50.

MASTER BANK MANAGER with many more facilities including ADFS, sideways RAM, 40/80 column screens. Only for the BBC Master and Compact computers £22.50.

BANK MANAGER BUSINESS UTILITIES adds trial balance and programmable spreadsheet reports to both Standard and Master Bank Managers for business users £12.00.

TYPING TUTOR. The recommended way to learn touch typing. 90 smoothly graded lessons and many facilities and options. Disc or tape £12.50.

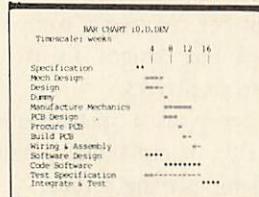
All orders should specify disc format required, 40 or 80 track, 5 1/4" or 3 1/2". Prices fully inclusive. Free postage in UK (overseas add £2.50). Enquiries and ACCESS credit card orders telephone 023 03 347.

CONTEX COMPUTING
15 WOODLANDS CLOSE, COIPLE, BEDFORD MK44 3UE

PAEAN SYSTEMS

For the BBC B, B+ & Master 128 Microcomputers

MICRO PERT



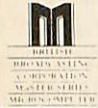
This program uses the PERT principle to organise projects (such as personal, corporate, educational, training projects etc.) in which numerous separate tasks are to be performed with minimum labour requirements at the lowest cost in the shortest time. It gives rapid estimates of costs and timescales, assessment of cashflow requirements, efficient allocation of labour resources and a 'What if' facility to gauge the effect of varying circumstances. The software can handle up to 64 tasks and 26 labour resources over 104 time units making it powerful enough to cover most applications. It contains two demonstration examples: a simple motor car service and a short printed circuit board development project.

TO ORDER Please send cheques/POs payable to PAEAN Systems and specify 40 or 80 track disc and the model of your BBC micro. Orders are normally despatched by return of post at 1st class rates.

AFTER SALES We provide an efficient help and advisory service to our customers.

OTHER TITLES Please ask for our catalogue.

PROGRAMMERS We are always interested to publish original software for the BBC models B, B+, Master 128 and 512 on specialist subjects.



PAEAN systems

Hollesley House, Hollesley,
Woodbridge, Suffolk IP12 3RH.
Telephone: (0394) 411250

If you're losing ground to your computer, put it smartly in its place with the new System-Solver desk from Opus.

At only £149.95+VAT we've thought of just about everything, including a free matching swivel chair.

System-Solver is British-built, designed for all leading PC systems and offers an unbeatable range of features:

- Spacious desktop with clever keyboard cable management
- Smooth-flow paper feed channels
- Space-saving top shelf for both monitor and printer
- Separate shelves for computer and manuals
- Secure lockable diskette box and tidy tray
- Sturdy steel underframes and heavy-duty castors
- Simple self-assembly

To order your System-Solver call Opus on **0737 765080** or simply post the coupon below. Delivery in mainland Britain is free and we offer generous education and government discounts.

Desk measurements: Height 27"; Width 47"; Depth 32".

To Dept. SP, Opus Supplies Ltd, 53 Ormside Way, Holmesthorpe Industrial Estate, Redhill, Surrey. Please send me the following:

System-Solver Desk(s) at £172.44 each (incl. VAT).

I enclose a cheque for £ _____ or please debit my credit card account with the amount of £ _____.

My Access Barclaycard (Please tick).

No. is: _____

Name _____

Address _____

Telephone _____

Opus

System-Solver

FREE CHAIR

Put your PC in its place

CONTRACT BRIDGE BRIDGE-MENTOR II

VERSION 1.10

"One of the best serious games programs"
MICRO USER

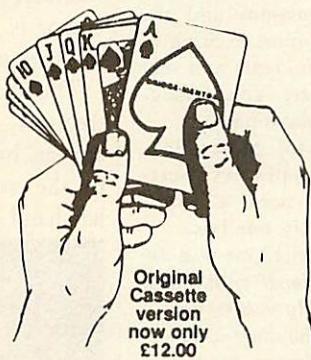
"the best offering we have seen for the
bridge player so far" BRIDGE CLUB REVIEW
"an ideal teaching aid" ACORN USER

"The internationally acclaimed system for the
COMPACT/MASTER/BBC/ELECTRON that can really
improve your standard of play"

Practise your bidding: Perfect
your card-play: Create your own
archive of interesting hands

With high resolution colour
graphics and sound,
BRIDGE-MENTOR II guides you,
step-by-step, through expertly
analysed hands. A host of features
including the spectacular
"AUTOPLAY" option. The package
now includes the famous
"Challenge" hands archive... in
total over 60 testing hands to
improve your game... with
unlimited scope for more!!!

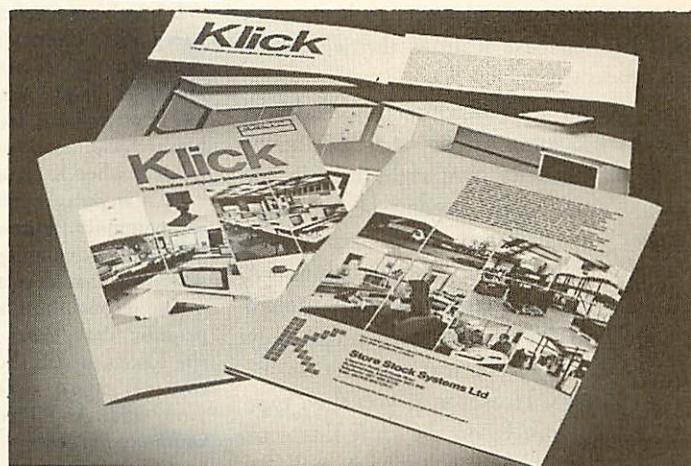
Now with comprehensive
24 page on-line user guide



PLUS FREE
software with
this ad

Klick

The flexible computer benching system



The Klick flexible benching system has been designed for constructing free standing benching which can be assembled quickly and easily. The Standard range is available in 3 heights and can be supplied with a selection of underbench storage units. The Flexi range provides the scope for any unusual size, height or configuration required. For product brochure and price list please contact:

Store Stock Systems Ltd, Claverton Road, off Floats Road, Wythenshawe, Manchester M23 9NE Telephone 061-998 9726

BRIDGE-MENTOR II Version 1.10 licensed copies available for all
MASTER/BBC/ELECTRON models with 32k+ DFS/DDFS and MASTER
COMPACT/ELECTRON (64k+) with ADFS. Also tape-to-disc for other disc systems.

5.25" Disc (DFS/ADFS)	£17.50
3.5" Disc (DFS/ADFS)	£19.50
Tape-to-Disc	£19.50

Please state 40/80 track and DFS where relevant

**Cheques to:- MINIC BUSINESS SERVICES,
12 WOBURN CLOSE,
BUSHEY, HERTS WD2 3XA.**

A PROFESSIONAL VIEW

The latest addition to the *View* family is a wordprocessor. Or is it a spreadsheet? Or a database? Steve Mansfield tries to find out

Give people a wordprocessor and the first thing they'll do is moan. The same is true, to a lesser extent, of spreadsheets and databases. These are the most commonly used application, and people spend long hours in front of the screen with them, so there's always something missing, always some feature you'd like but haven't got.

No program will please all of the people all of the time, but *View Professional* is doing its best by solving one of the more frequent problems – that of needing wordprocessing, spreadsheet and database facilities all at the same time.

View aficionados coming to this program for the first time are in for a shock. On the other hand, *ViewSheet* users will feel a little more at home. That's because *View Professional* most resembles a spreadsheet. It's not a wordprocessor, as many people were expecting, but a document processor. If that seems like splitting hairs then it's more than likely you've never had to produce anything very complex with your wordprocessor.

You can look at it in two ways – as a spreadsheet that allows you to use large amounts of formatted text, or as a wordprocessor that can calculate. In both cases there are database features thrown in for good measure.

The screen is arranged like a spreadsheet grid. Each column can be set to a different width and has its own right margin, or 'wrap width', which needn't be the same number of characters. This means, for example, that text typed into column A could be 80 characters wide even though the width of the column itself might only be 10 characters. The text goes across the other columns. However, if you then type text into column B, on the same line – or 'row' – the text in column A will be truncated. It's complex to describe, but in practice you soon get used to it.

The program has all the usual wordprocessing features – word wrap, justification, block copy, move and delete, and so on. In addition, there are many novel features in the program.

As well as a filename, each file can be



Options screen controls page layout

FIRST LOOK

With writing, your ideas either branch outwards or focus inwards. I'm a brancher. When I write with pencil and paper I end up with a heap of loosely connected bits of paper spread around the floor which then have to be pasted together. The great thing about bits of paper is that you can try out different ideas before getting out the glue.

Any wordprocessing package that wants to be more than a fancy typewriter has got to do a lot more than allow simple inserting and deleting. It has to sympathise with the user's own way of working, however peculiar that may be.

I was very excited when I first started using *View Professional*. Unlike *Wordwise* it promised me database functions and the ability to handle lists. But most exciting of all, it offered the facility to create and sort hierarchical lists, which are great hand-holders when it comes to planning.

This is potentially powerful. Most thinking combines figures, lists, notes, text, sorting and calculating. We need a wordprocessor that does all that in one box.

The second thing that excited me was the promise that *View Professional* could split the screen, which should help you to hold a contents page or notes on the same screen as your text. And I could aim at producing multi-column text too although lines of text kept disappearing from the screen when I moved the cursor to that line.

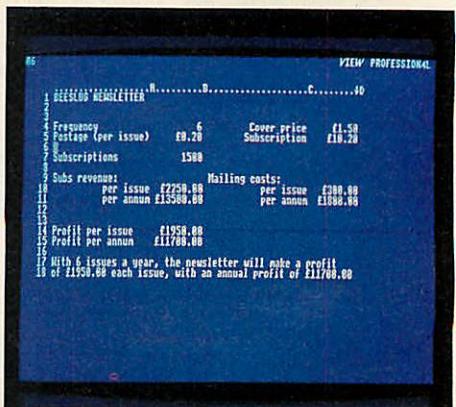
If your priority is writing, *View Professional* is not a tool that readily fits the hand. The manual does have a good tutorial section and I feel the experienced *View* user should be able to skip most of it, but I didn't feel confident or at ease with this complex system. I felt I was stumbling across its quite remarkable capabilities.

Doug Selway

given a title. This is done on the formatting screen, reached from the editing screen by hitting Escape, but its effect can also be seen in the document. That's because the title can be automatically embedded in the text. The '@' symbol is used for this. It's followed by a character which identifies what you want in that position – a T is used for the title, but you could also use a D for the date, a P for the page number or a reference to a slot. Finally, you put a string of @s, equal to the largest number of characters your string is likely to be.

This is handy for all kinds of things. Inserting the date and page number is obviously useful, the title facility less so. But it could well prove handy if you're using the package for your accounts. You can have a standard form for invoices, say, and by having the year as the title insert it automatically into invoice numbers. The slot reference facility also has obvious uses, like putting totals calculated from rows or columns of figures elsewhere into some text. There is something very interesting about these @-fields which also applies to several of *View Professional*'s features. The effect of the command is seen in the edit screen – you see the actual date or page number, for example, except when the cursor is on the same line, when you see the command itself.

This is true of any ranged-right or centred text. Normally you see it just as it will appear, but when you move the cursor on to the same line the text jumps to the left-hand side of the monitor screen.



Spreadsheet functions within the text

Text highlighting is the other feature to use this idea. Up to eight highlights are available for effects like underlining and so on. In the case of highlights 3 and 6 the code is shown as a reverse video number. But highlight 1, which is reversed for underlining, causes the text to be underlined on screen. Highlight 2 works in a similar way, although in this case the effect is to embolden the text.

On-screen underlining and bold text is all very well, if you can edit the effects. This is one area in which *InterWord*, for example, is very weak. In *View Professional* there's no problem. Moving the cursor on to the same line as the text turns off the effects and reveals the commands as reverse video characters, like the other highlights.

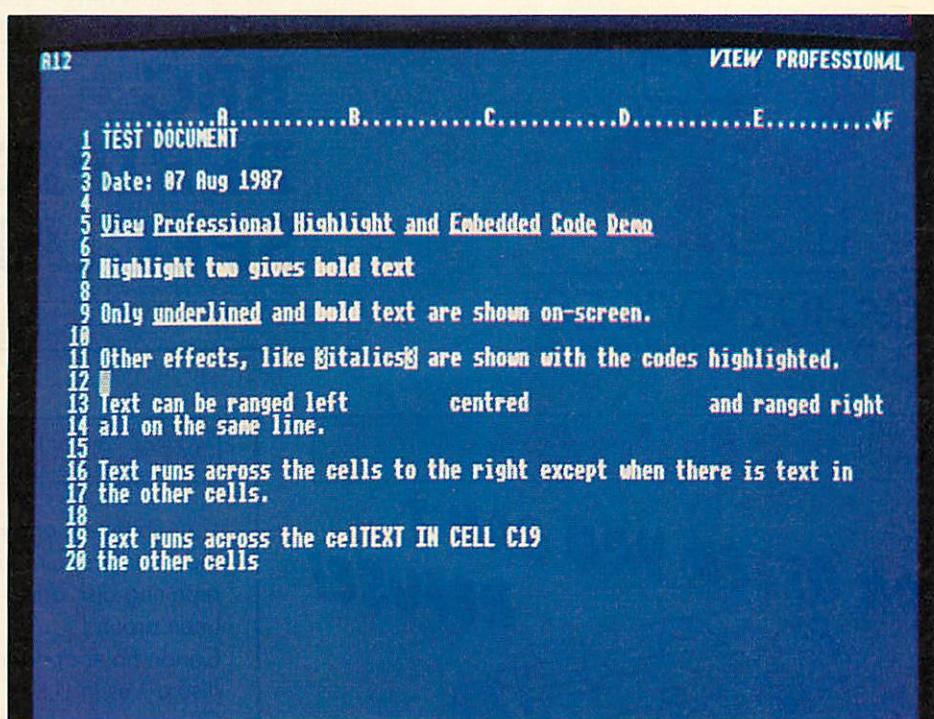
Incidentally, *View Professional* is planned to appear for the Archimedes. That version may well have other on-screen effects, like italics, superscript and subscript in the program.

The point about this system is that all the WYSIWYG effects, like underlining, ranged-right text and so on, are making the effects as easy to edit as possible. It can make the screen look very 'jumpy', with text leaping all over the place as you scroll around, but it's a reasonable compromise. Other on-screen features include the ability to freeze part of the screen, so that it's always visible while you scroll around the rest of the document. And it's possible to produce multi-column text, albeit in a fairly crude manner.

Any column can be sorted, numerically or alphabetically – which is the main database-like feature. The other is conditional output. When spooling, saving or printing a file, you can specify criteria. For example, you could save only those rows which have an entry in column A of over 10. And as *View Professional* recognises dates as a valid value type you could do a similar operation on entries before, on or after a certain date.

The software is command driven. You type a backslash followed by a code and any necessary parameters. This makes it easy to write command macros using exec files. Although the system starts up with all the function keys configured, you can change the action of any or all the red keys if you see fit.

Three versions of *View Professional* are supplied. There are two ROMs, plus images of those ROMs supplied on disc for people with at least two banks of sideways RAM; and a second processor version. Both 3.5-inch and 5.25-inch discs are sup-



Bold and underline effects are shown on the screen

SECOND LOOK

So who wants a wordprocessor that looks like a spreadsheet? That was my initial reaction when I first saw *View Professional*. It was difficult to see what would make it worthwhile changing from my familiar wordprocessor. Then, within an hour, someone asked me to arrange a *View* file of 350 words into alphabetical order, and suddenly I saw the value of a sorting command.

As a regular *View* family user, I found some features familiar, and was able to type simple letters without recourse to the manual. But others remained opaque at first – trying to enter multi-column text was a problem to begin with.

View Professional presents a good blend of facilities, but check which version you will use – the spreadsheet facilities of all but the second processor version are limited, lacking all trigonometric functions.

Being unable to change the screen mode or colour within the program is disconcerting – you have to do it before you start.

For the experienced user, the manual is less than ideal – for example, converting from *ViewSheet* to *Professional* format is covered in the single phrase: 'SheetVP converts a *ViewSheet* "contents" file, created with the PC command...'. But how do you create a "contents" file?

One feature I am particularly pleased to see is the ability to reassign all the function keys using the /DK command. In fact you can redefine all the keys automatically using an exec file.

The printer driver editor is a big improvement on the *View* original, with screen editing of the printer control codes. And old *View* printer drivers are still compatible with *View Professional*, providing you stick to highlight 1, 2 and 3.

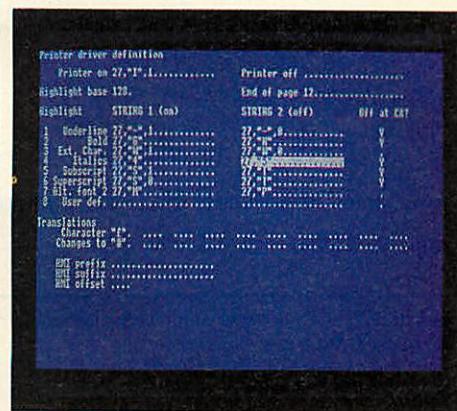
Graham Bell

plied, so you actually get the software no less than five times!

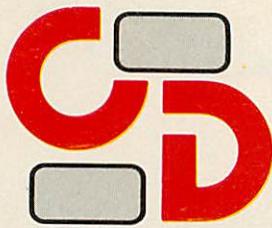
The system comes with an extremely easy to use printer driver editor, an extensive manual and a function keystrip.

The program really is very powerful. We've only been able to cover a few of its features here. I can see it proving popular with anyone producing financial or technical documents. It's ideal for tables, with its calculating and sorting features.

That said, I wouldn't go near it if I just wanted to write. As a wordprocessor it fails to impress. It has improvements on *View*, but also some limitations. For example, if you use rulers scattered throughout your text in *View*, you'll have a hard time with *View Professional* – you simply can't do that kind of thing. Finally, *View Professional* can be tricky. Its column-based formatting of text can lead to confusion and mistakes. It's certainly not a package designed for beginners.



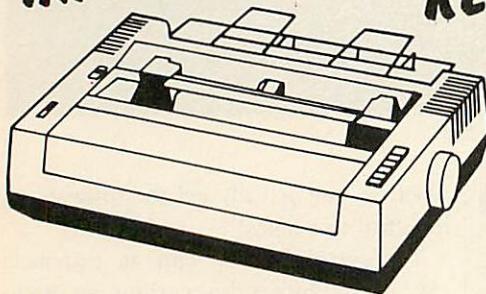
Printer driver editor screen



CARD DEVICES

PRINTERS

AN OFFER YOU CAN'T REFUSE!



This Panasonic KXP 1081 is the very latest in impact dot matrix printers.

It's very user friendly, with operator accessible print mode switch.

- ★ 120 cps draft printing.
- ★ 24 cps near letter quality (NLQ).
- ★ Parallel interface as standard, with optional Serial interface.
- ★ Epson and IBM compatible through dip switch settings.
- ★ Epson compatible mode including elite, emphasised, double strike, condensed, superscript.
- ★ 10, 12, 15, 17 characters per inch (cpi), italics and proportional in NLQ.
- ★ Prints 80 columns on A4 cut sheets, continuous, stationery or roll paper.

We don't need to give away any freebees; from us you get peace of mind with 2 years no quibble warranty.

For only £165 + V.A.T. KXP 1081

Panasonic Daisy Wheel also with 2 years warranty.

For only £250 + V.A.T. KXP 3131.

DELIVERY: 3 day courier on printers, disc drives and repaired disc drives is £6.00 inc. V.A.T.

P&P on consumables is free.

SALES HOTLINES: ☎ (04862) 65634/66996, Telex: 858541 CARDD G

BBC PERIPHERAL SPECIALISTS

DISC DRIVES SALES & SERVICE

Your complete answer to disc drive problems. We repair any repairable BBC disc drive. We have been repairing disc drives for nearly as long as they have been around.

Canon have appointed us to repair and service their disc drives in U.K.

Our experience speaks for itself.

Alignment, Repair and Test is £25.00 + V.A.T.
and parts when necessary

400K 40/80TK single with PSU, disc drive £145.00 + V.A.T.

800K 40/80TK dual with PSU, disc drive £265.00 + V.A.T.

Limited stock of the obsolete MDD 220 (40/80 400K)
for any one who needs a second drive £89.00 + V.A.T.

Winchester Hard Disc Systems, 20 MEG for only £475 + V.A.T. while stock last

CONSUMABLES

PAPER Plain white with micro-perf edges

11 X 9½	60 gsm	2000 sheets	£12.50
11 X 9½	70 gsm	2000 sheets	£15.50

DISKETTES Only quality labelled discs supplied all in plastic cases.

per box ten

Dysan 40 TK double sided/double density 104/2D £12.00

Dysan 80 TK double sided/double density 204/2D £18.00

Maxell 40 TK double sided/double density MD 2D £11.00

Maxell 80 TK double sided/double density MD 2DD £17.50

Don't compromise on the quality of the discs you buy just to save a few pence.

PLASTIC PRINTER STANDS £19.95 + V.A.T.

TO ORDER: Please remit by cheque/postal order Access/Visa to:
Card Devices Ltd., Padmores Yard, St. Johns, Woking, Surrey GU21 1SE.

Please allow maximum 14 days for delivery.

USER GROUPS

LONDON

London. Association of London Computer Clubs: Robin Bradbeer, Polytechnic Of North London, Holloway, London N7 8DB.

London. Association of Computer Clubs: Rupert Steele, 12 Philbeach Gardens, London SW5 9DY

London. Radio Amateur Micro User Group: contact by bulletin board No 86300198

East London. SOBAT Computer Club: Mr T A Kayani, 12 Calderon Road, London E11

Tel: 01-556 5423

North London. BBC Micro Users Group: Mr Ric Keyworth, 'The Penthouse', 4b Kilburn High Road, London NW6 5UL

Tel: 01-734 9235

North London. North London BBC Micro User Group: 82 Hornsey Lane, London N6 5LU

Tel: 01-263 6760 (even)

Wandsworth. Wandsworth Computer Club: C Kendrick, Earlsfield Library, Magdalen Road, London SW16

West London. Personal Computer Club: Chris, Tel: 01-743 1579;

Steve, Tel: 01-540 6271;

Blue, Tel: 01-579 5415

SOUTH-EAST

Aylesbury. BBC Micro User Group: Aston Clinton County Combined School, Twywell Lane, Aston Clinton, Aylesbury, Bucks HP22 5JJ Tel: (0296) 630276

Billericay. New JP101 user group, see for details, JP101 User Group, 8 Gardens, Billericay, Essex CM12 0HA

Bognor Regis. Bognor Computer Group E K Piper, 2 Ely Gardens, Aldwick Park, Bognor Regis, Sussex PO21 3RY

Bracknell. Bracknell Primary Schools Computer Users Group: D Donaldson, Wildridings County Junior School, Netherton, Bracknell, Berks RG12 4DX

Brighton, Hove & District. Brighton, Hove & District Computer Club: J Smith, 30 Leicester Villas, Hove, E. Sussex BN3 5SQ

Brighton. Brighton Area Micro Enthusiasts: c/o 41 Westdene Drive, Brighton. Prestel mailbox 919995582. Contact Mr Edwards

Bucks. South Bucks Acorn Computer Club: David Park, 160 White Hill, Chesham, Bucks HP5 1AZ

Tel: Chesham 783097

Camberley. Camberley Computer Users Club: David Crosby-Clarke

Tel: Crowthorne 771590

Prestel mailbox 34771590

Caterham. Computer Club: Caterham Leisure Centre, Godstone Road, Caterham, Surrey CR3 6RE

Guildford. West Surrey Computer Club: Jan Spencer, 52 Lindfield Gardens, Guildford, Surrey GU1 1TS

Tel: (0483) 63512

Harpden. Harpenden Microcomputer Group: P Cowley, 36 Southdown Road, Harpenden, Herts AL5 1PG

Harrow. Harrow Computer Group: Bazyle Butcher, 16 St Peter's Close, Bushey Heath, Watford WD2 3LG

Tel: 01-950 7068

Ilford. ILBUG: Peter Jones, 1 De Vere Gardens, Cranbrook, Ilford, Essex IG1 3EB

Tel: 01-554 9825

Iver. Iver Computer Society: John Haigh, 11 Colliston Walk, Ford's Farm, Calcot, Reading, Berks RG3 5ZJ

Tel: (0734) 417534

North & Mid Essex. User Group (NAMEBUG): Andy Purkiss, 12 Palm Close, Witham, Essex

Tel: (0376) 515609

Prestel: 376515609

Reading. Reading User Group (RUG): Richard Rowlands, Tel: Reading 596825 (even)

South East Essex. BBC User Group (SEEBUG): Mr A P Jordan, 97 Oakhurst Drive, Wickford, Essex SS12 0NW

Tel: Rayleigh 771428

Sutton. Sutton Library Computer Club: The

Secretary, 21 Village Row, Sutton, Surrey SM2 6JZ

Tel: 01-642 3102

Wellling. Computer Users Club: Tony Latham, 69 Hadlow Road, Wellling, Kent DA16 1AX

SOUTH & SOUTH-WEST

Abingdon. The National Elf Service: The Elf, 18 Kings Avenue, Marcham, Abingdon, Oxon OX13 6QA

Alton. Alton Computer & Electronics Society: Kevin Weatherhead, Sheen, Old Odiham Road, Alton, Hants GU34 4BW

Tel: Alton 87478

Fareham. Porchester & Fareham Computer Club: Simon Ward, 9a East Cams Close, Downend, Fareham, Hants PO16 8RP

Gosport. Borough of Gosport BBC Users Group (BOGBUG): Graham Dubber, 128 Wych Lane, Gosport, Hants PO13 0TE

Tel: (0329) 282221 (evenings)

MIDLANDS & ANGLIA

Boston. Boston Acorn Computer Users Club: J C Goodwin, 245 Church Green Road, Fishloft, Boston, Lincs PE21 0RP

Burton-on-Trent. Beeb Users' Group (Bug Club): Mrs Linda Yeomans, 13 Regent Street, Church Gresley, Burton-on-Trent, Staffs DE11 9PL

Tel: (0283) 216445 (even)

Cambridge. Bottisham Acorn User Group: Peter Rank,

Tel: Cambridge 812080, or Gerald Wilcockson, 19 Gallows Hill, Saffron Walden, Essex CB11 4DA

Tel: Saffron Walden 23793

Derby. The Derby Microcomputer Society: F Taylor, Secretary, c/o 5 Park View Close, Allestree, Derby DE3 2GH Tel: Derby 559334

Derby. Mrs B Bowman, 6 Shady Grove, Hilton, Derbyshire DE6 5PK Tel: (02837) 2529

Dudley. Kingswinford BBC Micro Club: Kingswinford Community Centre, High Street, Kingswinford, Dudley, West Midlands

Tel: Dudley 212538

Glossop. Glossop Computer Club (Derbyshire): T S Fox, 4 Park Lane, Little Hayfield, Stockport, Cheshire SK12 5NW

Tel: (0663) 44260

Norwich. Amateur Computer Club: Andy Leeder, Church Farm, Stratton St Michael, Norwich NR15 2QB

Norwich. Norwich & District BBC Microcomputer User Group: Roy Street, Church Farmhouse, Thelmlorther, Dereham, Norfolk NR20 5PS Tel: Foulsham 579

Nottingham. Micro Club: John Day, 8 Warkton Close, Chilwell, Notts NG9 5FR

Tel: (0602) 225660

Prestel: 602225660

Redditch. Redditch Computer Club: Anthony Green, 14 Radway Close, Redditch, Worcs B98 8RZ

Tel: (0527) 61434

Stoke. POTBUG BBC User Group: J Forest, 50 Cliff Street, Smallthorne, Stoke-on-Trent, Staffs

Tel: 818430

Stratford. Stratford Computer Club: Chris Parry, 15 Kipling Road, Stratford-on-Avon

Tel: (0789) 68080

Suffolk. West Suffolk BBC Micro Users' Club: Antony Hurden, 14 Plovers Way, Bury St Edmunds, Suffolk IP33 2NJ

NORTH-WEST

Blackburn. Baud: Blackburn Acorn User Domain, Yuticks Nest, Pringle Street, Blackburn, Lancs.

Cheshire. Mid-Cheshire Computer Club: Michael Christie, 496 The High Street, Winsford, Cheshire

Cumbria. West Cumbria User Group: P Majid, Tel: (0946) 62732 or K Purkiss, Tel: (0946) 66586

Liverpool. Mersey BBC User Group: Nik Kelly, 56 Queen's Drive, Liverpool L4 6SH

Rochdale. Beeb owners group, 81 Mornington Road, Kirkholt, Rochdale, Lancs. OL11 2QJ

Rochdale. Rochdale BBC Micro User Group: c/o 6 Dunbar Grove, Darnhill Estate, Heywood, Lancs OL10 3QJ

Wirral. Wirral Micro Users Club: David Walsh, 23 The Pines, Bebington, Wirral, Merseyside L63 9PH

NORTH-EAST

Bridlington. Solinet: Kenneth Hardacre, 13 St John Street, Bridlington, East Yorkshire YO16 5NL

Huddersfield. Huddersfield BBC Micro User Group: S Gill, 21 Mayfair Avenue, Sowood, Halifax, W. Yorks Tel: (0422) 73058

Hull. Forum 80: 421 Endike Lane, Hull HU6 8AG

Hull. MUSE (for teachers): PO Box 43, 231/2 Friary Chambers, Whitefriargate, Hull HU1 2HD

Tel: (0482) 20268

Keighley. Keighley Computer Club: Colin Price, 'Apple Garth', The Hob Hill, Steeton, Keighley, W. Yorks

Tel: (0535) 54738

Leeds. Garforth BBC User Group: D G Pell, 84 Park Lane, Rothwell, Leeds LS26 0EY

Newcastle. Newcastle & Washington BBC User Group (NEWBUG): Multi-purpose centre, Oxclose Village, Washington, Tyne & Wear

Tel: (0783) 813175 (even)

Northumberland. NEBUG: Ian Douglas Chapman, 13 Pont St, Ashington, Northumberland

Tel: 0670 856273

Sheffield. Parsons Cross BBC User Group: Andrew Grant, 28 Rokeby Road, Sheffield S5 9FU

Tel: (0742) 461203

S Yorks. South Yorks Personal Computer Group: Bob Hindle, 139 Penrhyn Road, Sheffield S11 8UP

Wakefield. Wakefield BBC Micro User Group: PO Box 65, Wakefield, West Yorkshire WF2 6YZ

SCOTLAND

Central Scotland. BBC User Group: D Davidson, 1 Roxburgh Place, Larbert, Stirlingshire FK5 4UE

Tel: (0324) 558692

Inverclyde. Inverclyde BBC Micro Users Club: Robert Watt, 38 Wellyard Way, Greenock, Renfrewshire PA16 0XG

Tel: Gourock 39967

WALES

Cardiff. Cardiff BBC Computer Club: Geoffrey Barker, 2 Whiteliffe Drive, Penarth CF6 2RY

Tel: (0222) 701023

N. IRELAND

Belfast. Belfast Computer Club: Andrew White, 19 Greenpark Drive, Markethill, Co Armagh BT60 1PX

OVERSEAS

Australia: BBC Users Group of Canberra: PO Box E58, Queen Victoria Terrace, ACT 2600

Australia. Beebnet: M A Cowley, PO Box 262, Kingswood, South Australia 5062

Australia. Ozbeeb Sydney, meetings North Ryde, PO Box 1030, Parramatta 2150

Tel: day 635 4868, eve 868 4455

Australia. Daptco BBC User Group: PO Box 447, Daptco, NSW 2530

Canada. Atom Users Group of Canada: John Wood, 812 Cabot Trail, Milton, Ontario L9T 3M8

Canary Islands (Spain). BBC Micro Club Tenerife: PO Box 560, 3800 Santa Cruz de Tenerife

Ire. Irish Amateur Computer Club: Austin Vaughan, 35 Monastery Drive, Clondalkin, Dublin 22. Tel: 01-593112 (even)

Eire. OIFIG (Official Irish Fort Interest Group): c/o Hugh Dobbs, Newton School, Waterford

Finland. Arien Raateland, Hopeatie 10A21, 00440 Helsinki 44

France. Club Informatique Assevent: Claude Laurent, 1 rue du Marchal Leclerc, Assevent 59600. Tel: (27) 652294

Greece. Microclub: C Mantazavatos, 17 Stournara Str. 106 82 Athens

Hong Kong. Acorn Computer Users Society of Hong Kong: PO Box 13330, Central PO, HK

Malaysia. Sabah Computer User Group: c/o Albert Vun, PO Box 69, Kota Vun, Sabah, Malaysia

Malta. BBC Micro Users Club (Malbeeb): Ray C Zammit, 20 Oleander Avenue, Santa Lucia

Netherlands. Big Ben Club:

J W Vuurpijl, Hein Baderstraat 36, 2171 XP Sassenheim

New Zealand. BBC/Acorn Computer User Group of NZ: PO Box 9592, Wellington

New Zealand. Christchurch BBC & Electron Users Group: Mrs Rebe Nolan, 87 Palmers Road, Christchurch 9

Norway. BBC INFO: Horten

Ingenlørhøgskole, Skipperg. 6, 3190 Horten

Norway. Skandinavian BBC User Group: Frans-Otto Hendriks, Ludvig Karstensvei 14, 1064 Oslo 10

Pakistan. BBC Users Group:

Capt. Z A Kidwai. Tel: Karachi 540986

South Africa. Acorn Atom Users Group: J G Dowling, 27 Oribi Avenue, Van Riebeeck Park, Kempton Park 1620

South Africa. Pretoria BBC Users Group: Stan Miller, PO Box 117, Montana 0151

South Africa. Tygerberg BBC User Group (Tygerbug): R P Donavan, 16 Bakker Street, Welgevred, Bellville 7530

Sweden. BBC User Group: Anders Wichman, Folkungagatan 58, 11622 Stockholm

Sweden. Acorn User Society of Sweden: Tord Israelson, Tuppala Klaras Vag 12, S-702 29, Orebro, Sweden

Tasmania. BBC Users Group (Tasbee): Box 25 PO, North Hobart 7002

SPECIAL

INTEREST

Accounts. BEEBACC: Brian Pain, 40a High Street, Stony Stratford, Milton Keynes Tel: (0908) 564271

Adventure. International Adventure Club: Simon Martin Clarke, 10 Ennis Close, Harpenden, Herts AL5 1SS

Atom. Acorn Atom User Club: Kevin Roll, 66 Shaldon Drive, Morden, Surrey Tel: 01-540 5282

Bulletin Boards. Forum 80: 421 Endike Lane, Hull HU6 8AG

CP/M. CP/M User Group: Diana Fordred, 72 Mill Road, Hawley, Dartford, Kent Tel: (0322) 22669

Disc Users. Format 40/80 Club (BBC Disc User Group): Peter Hughes, 5 Marsh Street, Bristol BS1 4AA

Econet. User Group (Scotland): c/o Michael Ryan, Balkeerie Cottage, Eassie, by Forfar, Angus

Education. Micros and Primary Education (MAPE): c/o Mrs G Jones, 76 Sudbrook Holme Drive, Sudbrook, Lincs LN2 2SF

Electronics. Alton Computer & Electronics Society: Kevin Weatherhead, Sheen, Old Odiham Road, Alton, Hants GU34 4BW

Tel: Alton 87478

Heraldry Society. Colin Forrester, 5 Hook Road, Epsom, Surrey KT19 8TH

Logo. British Logo Users Group (BLUG): Richard Olney, c/o London Technology Network, 86-100 St Pancras Way, London WC1

MUSE. PO Box 43, Houghton on the Hill, Leicester LE7 9GX. Tel: (0533) 433839

Radio. AMRAC (Amateur Radio and Computers): Mr T Triggle, Glenness, East Boldre, Brockenhurst, Hants SO42 7WD

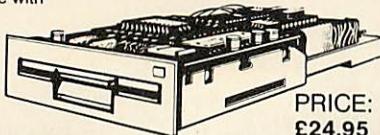
Tel: (0590) 612130

RAF Personal Computer Association: Sqn Ldr J A Uptham, Man S (ADP), HQ RAFSC, RAF Brampton, Huntingdon PE18 8OL

3" HITACHI DISK DRIVES

Suitable for use on the Amstrad 6128, 664, Tatung Einstein, BBC with DFS. 40 track, double density, 3 ms track access time. Unformatted capacity — single sided 250K. Shugart interface. Plug compatible with 5 1/4 inch drives.

Cables available for connection to:
Amstrad — £7.50 plus VAT.
BBC — £7.50 plus VAT.
Tatung installation pack — £12.00 plus VAT.



PRICE: £24.95
+ VAT

CARRIAGE £3 + VAT.

FOR FURTHER DETAILS SEND S.A.E. TO:

MATMOS Ltd., Unit 11, Lindfield Enterprise Park, Lewes Road, LINDFIELD, West Sussex, RH16 2LX. Tel. 0444-73830/0444-414484/0444-454377

Or Computer Appreciation, 111 Northgate, CANTERBURY, Kent CT1 1BH. Tel. 0227-470512

SPIDER 2 REAL-TIME CONTROL FOR THE BBC MICRO

Watch the SPIDER!

Powerful new BASIC commands for invoking PROCs from the User Port, Serial Port or the Keyboard.

8 independent countdown timers.

Easy to install with no soldering.

Comprehensive manual supplied.

New SPIDER 2 features

Special keywords for controlling the Serial Port.

Professional implementation of Foreground/Background processing.

Reaction timing and pulse trains accurate to 0.1 milliseconds!

from £65 including VAT

SPIDER 2 is a RAM/ROM combination which uses none of the BBC's memory, so BASIC programs are unaffected. The BBC B+ is fully supported and we supply a complete range of digital, analogue and serial interfaces for use with SPIDER using the 1MHz bus.

Ask now for details.

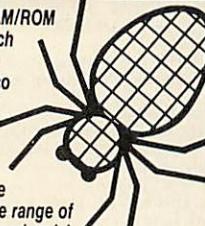
NOW AVAILABLE
FOR BBC MASTER

Paul Fray Ltd

Willowcroft, Histon Road, Cambridge CB4 3JD

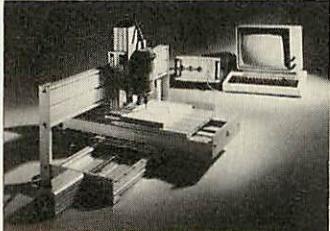
Telephone: (0223) 66529

SPIDER stamps out 10 bugs



AA211

LOW COST XYZ TABLES



N.C. Work Station for Drilling, Routing, Engraving etc. 200 mm x 300 mm x 100 mm XYZ table and controller from £2400. Outputs from 'STARCAD', 'LINTRACK PCB' or any other software using MOVE, DRAW or PLOT commands can be sent to the machine via RS.232 link

LEEWOOD DEVELOPMENTS LTD
UPTON, CAMBS.
TEL (0480) 890860 (24 Hr)

ROOM 7 SOFTWARE

INTRODUCTION TO STATISTICS

This very user friendly program will prove a valuable aid to anyone studying statistics. The program covers statistical diagrams and mean, median, standard deviation etc. as well as calculations for statistical tests. The program is available on disc only for the BBC B and MASTER 128.

£9.95 inc. VAT

EASY BANKER

Fully automatic standing order processing makes this package ideal for keeping track regular income and expenditure. The program is very easy to use as all data input is by means of templates and can be easily edited at any time. Any number of data discs can be used in any of the disc drives (0 to 3) with up to 20 accounts per disc. Available on 5.25" disc only for the BBC B, MASTER 128, or the ELECTRON.

£8.50 inc. VAT

Also covered by our catalogue — Soccer Boss, Pools cheque, Investment Analyser 2, Matrix, Central Heating calculator, Electrical cable selector and Structural Beam calculator. Details on request.

NEW
Fully Bound
software
catalogue
50p p&p
Refundable if
order is
received within
one month.



ACORN USER ADVERTISEMENT PAGES — OCTOBER 1987

3SL	152	Marconi	148
4MATION	152	Matmos	174
AB Designs	18	Mchugh Enterprises	174
Acornsoft	IBC	Meadow Computers	160
ACP	56,57	Mertec	137
Akhter Computer Group	12,14	Mewsoft	50
Amcom	148	Micro-Media	1
AMS	145	Microaid	93
B & S Computing	139	Microfix	138
Beebug	4,6	Microhelp	142
Brainsoft	32	Micromon Computers	108,109
C & F Associates	166	Micropower	80
Card Devices	172	Microstudio	142
Care Electronics	10	Millipede Electronic Graphics	158
Centec	162	Minerva Systems	23
CJE Microcomputers	156	Minic Business Services	169
Clares Micro Supplies	150	Morley Electronics	100,101
Clwyd Technics	98	Nebulae	32
Community	166	Oak Computers	104
Comp-Shop	142	Opus Supplies Ltd	168
Computech	168	Paean Systems	168
Computer Concepts	84,86	Paulifray Ltd	174
Computer Express	96	Peartree	27-30
Computer Services	34	Pineapple Software	92
Contex Computing	168	PMS	106
Croydon Computer Centre	138	Portobello Trading	174
Cygnet	50	Premier Software	50
Database Publications	22	Raycomp	168
Dataphone	164	RBRC Ltd	160
Datastore	38	Robico	90
Datathorn Systems	10	Saxon	152
DGA	160	Selec Software	166
Dial-A-Disc	138	Slogger	24,25
Digital Services Ltd	162	Star Devices	38
Edusoft	140	Store Stock Systems	169
Electroniquequip	150	Superior Software	IFC,0BC
Elliot James	162	System	108
Elsevier Biosoft	104	Systems Software	38
General Information Systems Ltd	112	Technomatic	59-65
Gryphon Software	174	Twilstar Computers	66,67
HCCS	152	Vanadis	138
HCR	140	Viglen Computer Supplies	5
Home Based Business	168	Vine Micros	136
Ice-King	138	Watford Electronics	68-79
KM Software	104	We-Serve	158
LCL	140	Whittle Systems	148
Leewood Developments	174	WIDA	160
Logotron	144	WL Computer Services	174
Manor Court Supplies	94	Yellow Pages	20,21

"DISKS" AT LOW PRICES

SUPERSTAR

5 1/4" DSDD £5.50 per 10

3 1/2 DSDD £1.00 each

BASF

5 1/4" DSDD £7.50 per 10

ALL DISKS GUARANTEED!!

All the above are plus 50p. p&p

Make cheques/P.O. payable to:

GRYPHON SOFTWARE SYSTEMS LTD.
P.O. BOX 255, BRIDGEND, S. WALES

Minimum of £150.00 trade in for any working BBC Model B against any of the products listed below. (With Acorn DFS add £40.00)

Archimedes 300 series from	£799.00
Acorn Master 128	£395.00
Amstrad PC 1512 full range from	£449.00
Amstrad PC 1640 full range from	£799.00
Atari 520 STFM	£260.00
Atari 520 STFM + Mono Monitor	£346.96
Atari 140 STF	£433.91
Atari 1040 STF	£520.87

Full range of peripherals and software available for all the above micros.

All the above prices exclude VAT but include carriage.

Retail shop open 9.30am to 5.30pm Monday — Saturday.

Portobello Trading Company

Phone 031 657 2988

300-302 Portobello High Street, Edinburgh EH15 2AS



Letters/cheques to: W.L. Computer Services, Dept. 2, H.S.L. Building, 437 Warrington Road, Rainhill, Merseyside L35 4LL. Tel. 051-426 9660

FREE ADS

BBC disc drive users wanted as penpals to swap tips, etc. Write to A Walker, 2 Arnold Lane, Gedling, Nottingham NG4 4BE.

Penpals wanted to swap hints, tips, info, including disc, m/code and SWR. Write to: Ian Salmon, 18 Fillioll Close, Hanningfield, Essex CM3 8UX.

Penpal wanted who owns an Electron. Write to: Samuel Day, 22 Castle Street, South Glamorgan, South Wales CF6 8JR. All letters answered.

Written any good sprite routines? Help a struggling student and write to Vince, 8 Springwood Avenue, Stirling FK8 2HN. (BBC B + disc).

French BBC user wants correspondent in England. In English or French. Patrice Godiani, Le Verdi 3C Ave. Jean Moulin, 83400 Hyères, France.

Penpal wanted for BBC B owner, to swap tips, demos, etc. Matt Evans, 5 Frank Crosse Drive, Upton Magna SY4 4TS.

Penpals wanted, swap hints and tips. 2Meg 32k board £33. AMX Mouse £21. Super Art ROM £35. Pagemaker £35. Tel: 01-968 3454.

BBC B DFS 40/80 drive. High res, green monitor, APTL board, +16k toolkit, D. Doctor, Database, InterWord, SpellMaster ROMs + more, books & software. £650 ono. Tel: (0628) 31987.

UMI 2B Sequencer, DX100 Yamaha Synthesiser, Roland 707 drum machine, Roland amplifier (stereo) + two boxes, FB01 Synth. All in mint condition, incl all cables. Any offers considered. Tel: (0932) 58065.

Brother HRS printer (Thermal) serial interface, including paper, ink and lead. Hardly used. £60 ono. Tel: 01-397 9579 (evenings).

64k Electron Plus1 Plus3 user port. View, Viewsheet, Viewstore, ARM, T2P3(2), Art, 10 discs, assorted software, all manuals, £300. Tel: 0734) 665180.

Solidisk 4Meg 32k board £30. Old type 32k SWR £15. BBC data recorder £15. Amber 4000 printer £40. Tel: (0768) 64890.

Electron E2P second processor, plus operating software, £50 ono. Tel: Taunton (0823) 256850 evenings.

BBC B with disc interface, and two 80-track drives. Separate power supply £340, ono. Tel: Doug. (0368) 76435, evenings.

BBC B, 12 ROM board, DFS, 40/80-track disc drive, MXP-1080 printer, Pagemaker, SuperArt + Mouse, Wordwise, Dumpout 3, Toolkit, £500. Tel: 01-459 3070.

Wanted Plus 1, Plus 3 or Slogger equiv for Electron. Send details and price to: D Lane, 5 Tile Farm Road, Orpington, Kent BR6 9RY.

Two Cumana 40-track 100k disc drives (with PSU), one drive 0, one drive 1. £60 each. Tel: Mike 051-639 4516, after 6pm.

Acorn ADFS, £15. Acornsoft ISO - Pascal stand-alone generator, unused, £20. Tel: (0704) 77864.

BBC B 40/80-track disc drive, modem, green-screen monitor, cassette recorder, Pagemaker, music system. More software, joysticks £450. Tel: (0902) 758026.

BBC Master 128k, as new, with advanced handbooks and three cartridge, cost £530. Accept £380. Tel: 01-557 6389.

BBC all manuals, Acorn DFS Sidewise, Cumana 40-track ROMs, Wordwise Plus, Ultracalc, InterSheet, many games

disc/cassette. £450 ono. Tel: (0837) 3046. Akhter 5.25-inch double-sided 40/80-track switchable disc drive, with integral power supply, £85 ono. Phone Jeremy on 01-554 0037.

Wanted 6502 second processor with or without HiBasic. Tel: (0745) 825036 anytime. Ask for Paul.

Bargain! Master Compact new! Won in competition. Keyboard, colour monitor, disc drive, nine month guarantee. £500. Tel: (0622) 27238, evenings.

Electron Turbo Driver disc drive, games, leads, manuals etc., £230. Electron ROM Box, graphics chip, data recorder, games, £120. Tel: Horndean (0705) 595691.

Acorn Bitstick £165, boxed as new. Global products P8000 industrial, EPROM programmer, £275. Tel: Paul Derby (0332) 362798.

APTL SR Board. Twin 40-track s/s d/drives, plus Page, PSU, Help, Spellcheck, Sleuth, Toolkit plus ROMs. Half price. Tel: (0635) 62391 (after 2100 hrs).

Electron Plus 1, Plus 3, PMS E28 (65C02), Hi-Basic, Lisp, graphics ROM, View, ViewSheet, Database, utils, games, mags: £360. Tel: 051-546 1543. Namal Type and Talk speech unit wanted. Instruction guide to fit unit to BBC. Can anyone help? Tel: (0293) 21831.

Computer desk with TV stand and shelf 48.5 x 24.5 x 28.5. £30. Also Watford Electronics Dumpout 3. Printer dump ROM for the BBC micro. £14. Tel: 061-223 5068.

Master 128 plus Turbo 6502 second processor. Boxed as new. £450. Tel: (0223) 812322.

Philips LFH290 pocket memo, LFH1505 dictation transcriber. New. Unwanted prize. Retails at £315, yours for £240 ono. Tel: (0223) 357411.

Modem owners! Ring UK's leading bulletin board, using the top leading HBBS+ software. The Belle Vue Board. Tel: (0274) 498221.

Electron, Plus 1, Track-ball plus software, data recorder, over 35 software tapes, View, 29 EUM manuals FBI+CT. £130 ono. Tel: 061-643 9179, after 6pm, Paul.

Electron Plus 1, data recorder, Acorn JP101 printer, seven ROM cartridges, including View, software (mostly Acornsoft), books. All boxed. £160 ono. Tel: 661 8684 (daytime).

BBC B issue 7. Joystick, data recorder

programs. View wordprocessor + manual. Good reason for sale. £250. CZ101 polyphonic Midi synth, case £185. Tel: 01-609 7504.

BBC B Acorn DFS, dual discs, Epson RX80, Wordwise Plus, Disc Doctor, Beebcalc, Printmaster, Toolkit, Microvitec monitor, masses of disc/tape software, £500. Tel: 051-928 7457 after 6pm.

BBC B DFS disc drives colour monitor, AMX Mouse, many extra ROMs, much software, worth £1000, sell £850 ono. Tel: (0865) 68037.

For sale: BBC B, disc drive, DFS, AMX mouse, 32k sideways RAM, joysticks and much software. Tel: Dave on (0405) 861186.

Full set of Micro User and Acorn User from issue No 1 to date. Offers? Tel: Sheffield (0742) 745027.

Acorn 6502 second processor, DNFS, Hi-Basic, Hi-Wordwise Plus as new, £95. Also Watford DDFS £40. Tel: Adrian 01-992 4935.

32k sideways RAM for sale Ring Adam, (0295) 65857. After 6pm.

Wanted Plus 3 disc interface for Electron or any other 3.5-inch disc drive with PSU. Tel: Stewart on (0968) 76708 after 6pm.

Printmaster ROM, unopened £15. Pack wet disc head cleaners £2.50. Wanted medium/high res colour monitor. Tel: (0924) 263503.

BBC B computer + DDDFS £235, two 1 megabyte drives £100 each, monitor £50, daisywheel £235, View chips etc. Tel: 01-202 8540.

BBC disc drive, 100k single sided with cables. Utility disc £40 ono. Electron ViewSheet ROM, brand new £10. Tel: 091-586 5587 after 6pm.

Printers: 8056 Dixons, RS232. £40. MCP40 colour plotter both with manuals £40. or £75 both. Tel: (0375) 379901, Spencer.

BBC B, Acorn DFS, Teletext Adapter, Cumana 100k disc drive, tape recorder. Lots of games, magazines, books. Will sell for £520. Tel: 01-854 6283. Jimmy after 5pm.

Power supply (BBC) brand new, only £40 ono. Tel: (0224) 642765 evenings, (Alan).

BBC B OS 1.2, Acorn DFS 40-track single sided drive, games, lockable disc box, 50 ds dd discs, mags leads, manuals. £320 Tel: (0382) 68601.

Swap tuner/amplifier; boxed, unused, value £110, for BBC B hardware such as

mouse, teletext adapter, digitiser etc. Tel: (028 373) 2529.

Wanted AMX Mouse or similar plus single/double sided disc drive 40/80 track switchable, also ATPL Sidewise. Tel: 051-733 8654 after 6.00pm.

Unused Acorn ADFS ROM, manual, disc £20. Also Acorn Basic 2 £10. Watford DFS ROM+ manual £6. Tel: (0532) 740656.

Beginner? Electronic package: two computers, printer, recorder, hardware, talk-back, literature, Big-trak Robot, lots more. £159 ono. Tel: (045822) 3914. Solidisk problems? Advice, cures, help. Join Solinet User Group. Send sae to Solinet, 13 St John Street, Bridlington YO16 5NL.

SWR128 +15 discs: £45, Prism 2000 modem +ROM: £20, WE lightpen +software: £10, 27128: £2. Tel: 051-220 5470.

BBC Master, double drives, some original software, 25 blank discs, ROM cartridges etc, £530. Contact Richard on (08894) 6772, evenings only.

Microvitec monitor, standard resolution. Two years old, including BBC lead, £95 ono. Tel: 01-653 4325.

Wanted BBC B. DFS-less preferred, without add-ons. Cash waiting for good condition, late series machine. Tel: (049481) 3222 evenings.

Dragon 64 + disc drive + software worth £600+, sell £185 ono or swap DS-DD 80-track dual drive +PSU. Buyer collects. Tel: Paul 051-924 1727 evenings only.

BBC B, + Cumana dual, switchable drives, Philips hi-res monitor, View, 64k sideways RAM, joysticks, software, books. £695. Tel: Simon (04022) 51253.

BBC B Watford DFS, 40/80 drive, Replay mouse, Superart ROM, games, magazines, lots of books. £380 ono. Tel: (0656) 880961

Morley Teletext Adapter with advanced system ROM, utilities disc and power supply unit, £50. Tel: 01-952 7224.

BBC B ATPL, ROM/RAM Board, EPROM Programmer, Challenger 3 drive, over 100 programs, Megamouse, joystick, documentation, five ROMs, 32k SWR, £695 ono. Tel: (05086) 3517.

BBC B, 128k SWR, CDC 40/80, DS/DD disc drive, Epson P40 printer, joystick, and lots of software £350. Tel: (0706) 341041.

32k sideways RAM for sale. Ring Adam, (0295) 65857 after 6pm.

FREE PERSONAL AD SERVICE

Fill in the form below to a maximum of 20 words (one in each box) and send it to *Acorn User* Free Ads, 141-143 Drury Lane, London WC2B 5TF. Please use capital letters, write clearly, and remember your name, address and telephone number. Without this full information, supplied on a separate sheet of paper, we regret we cannot carry your Free Ad. We cannot accept entries selling or swapping software. This is a service to readers - no companies please. One entry per form only. Free Ads are carried in the magazine as space permits, and any Free Ads not used within a month of receipt will be disposed of.

ACORN USER'S

DIARY

Show me the way to go home



Hysteria reached a peak at the *Acorn User* show when investigative journalist and ex-fighter pilot Phil Rotsky stumbled into the Barbican carrying a large and suspicious parcel.

'It's the 68000 second processor,' Rotsky explained to fellow hack Orson Fact, 'Amazin', init?' He plugged it into the Archimedes, using surprisingly few leads.

With gasps from the assembled crowd, the Archimedes screen burst into life, with *Gauntlet* - the game of the moment. There were the graphics that had gripped the imagination of all games players, at least as good as the Atari version.

Fascinated crowds and bemused Acorn staff looked on as games supremo David Lawrence put *Gauntlet* through its paces. Meanwhile, Rotsky made his excuses and left.

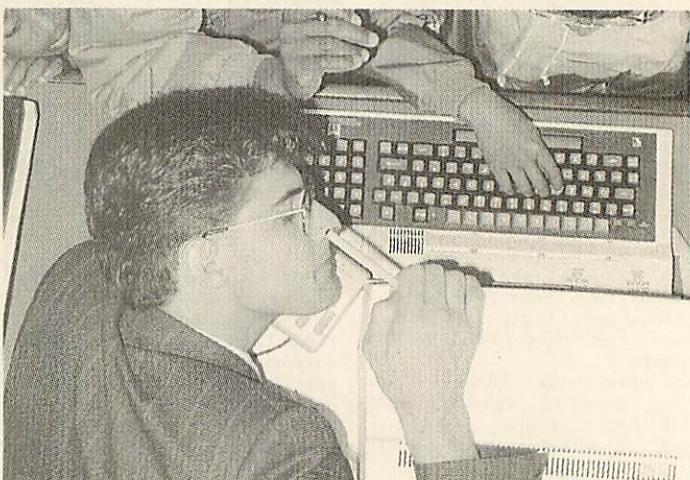


EMR's ever-theatrical Mike Beecher has not denied that his driving prowess made attending the *AU* show an expensive trip.

After being clamped earlier this year, he is counting the cost of a speeding ticket on his way to the Barbican.



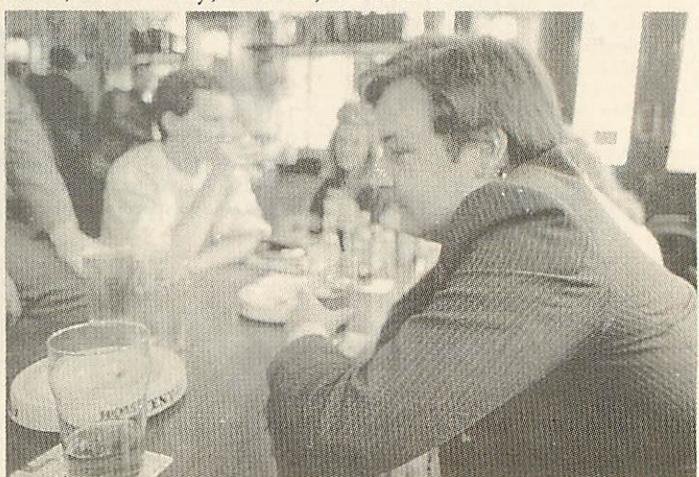
Ed Quinn listens quietly to John Cope who opened the show



Watford staff dealing effortlessly with the public

■ Who were the people at the exhibitor's party who so desperately wanted to get their names into *Acorn Abuser*? Even resorting to threats of violence and minor acts of hooliganism will not get them named.

We might mention their illustrious competitors though: Wigmore, Nidd Valley, Marconi, Watford . . .



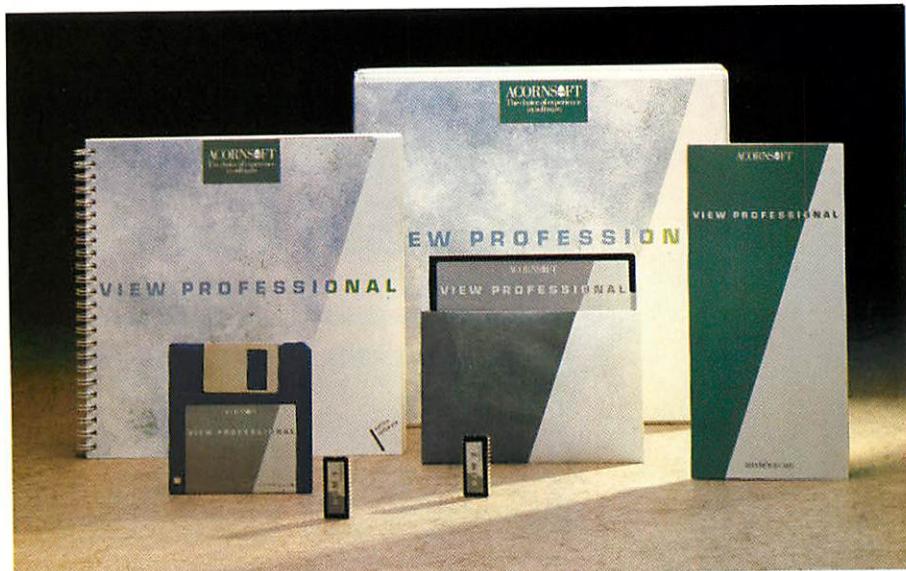
David Atherton sighted under a table in a pub during the show

WE'RE ABOUT TO CHANGE YOUR VIEW OF WORD PROCESSING.

View Professional is the latest addition to the well-known View suite of productivity software.

A highly advanced Word Processor, it also includes spreadsheet and database facilities to form a single, powerful package.

So for example, you could prepare a price list, add it up, create a second column for V.A.T., write a letter around it and send it to a hundred addresses without even switching programs.



Easy to use, View Professional is suitable for the BBC B, B+, Master 128 and Master Compact and costs £99.95. A version for Archimedes will be available later in the year. View it now at your local Acorn dealer.

ACORN SOFTWARE

V I E W P R O F E S S I O N A L

Acorn Computers Ltd., Technopark, 645 Newmarket Road, Cambridge CB5 8PD. Tel: 0223 214411.
Or contact: Vector Services Limited, 13 Denington Road, Wellingborough NN8 2RL. Tel: 0933 79300.

Palace of Magic



Over 100 Screens full of Challenging Puzzles and Awesome Foes

By practising acts of benevolence and goodwill, you have offended the evil wizard Caldeiti. Summoning forth his satanic powers in order to extract retribution, he has cast two powerful spells upon you: (1) you have been reduced to the size of a dwarf; (2) Caldeiti has banished you to one of his old homes, the "Palace of Magic".

The palace and its surrounding land is littered with magical objects and mysterious creatures. It is rumoured that there is also a hidden transporter — your only means of escape from this enchanted place.

After exploring the rooms of the palace, you should venture forth through the enclosing woodland: towards the ancient church and the eerie dungeons, or through the maze of secret passages, or over the river to the princess's house.

On your journeys, you will encounter many strange animals and people including rock monsters, gremlins, imps and guards. Some are good and some are evil. You will need to decide who you can trust to help you in this arduous quest.

BBC Micro Cassette.....£9.95 Acorn Electron Cassette.....£9.95
 BBC Micro 5 1/4" Disc.....£11.95 Acorn Electron 5 1/4" Disc.....£11.95
 BBC Master Compact 3 1/2" Disc.....£14.95 Acorn Electron 3 1/2" Disc.....£14.95

(Compatible with the BBC B, B+ and Master Series computers).

PRIZE COMPETITION

The first prize in our competition is a treasure chest containing over £200 worth of mystical and magical artefacts. 10 runners-up will each receive £5 and a signed certificate.

To enter the competition, you must complete the "Palace of Magic" adventure, and note down the congratulatory message you receive. Closing Date: 30th April, 1988.

**SUPERIOR
SOFTWARE
Limited**

ACORN SOFTWARE

Dept. PM2, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453

Please make
all cheques
payable to
"Superior
Software Ltd."



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS



OUR GUARANTEE
 • All mail orders are despatched within 24 hours by first-class post.
 • Postage and packing is free.
 • Faulty cassettes and discs will be replaced immediately.
 (This does not affect your statutory rights).